SHARP SERVICE MANUAL

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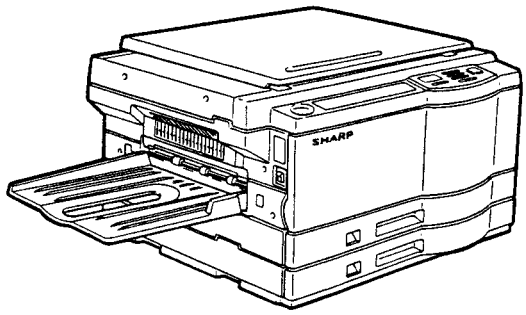

MODEL SF-7830

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PARTS LIST AND GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

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The contents are subject to change without notice.

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[1] BASIC SPECIFICATIONS

	SF-7855/7830
Model:	Desktop
Copying system:	Dry type electrostatic plain paper copy
Document:	Sheet, book
Document size:	Max. A3 (11" x 17")
Copy size:	Max. A3 (11" x 17") Min. A6 (8½" x 5½")
Copy speed:	Normal / Reduce (50%) / Enlarge (200%)
A4 (8½" x 11") portrait	15 sheets/min / 12 sheets/min / 9 sheets/min
B5 (8½" x 5½) portrait	15 sheets/min / 12 sheets/min / 9 sheets/min
A4 (8½" x 11") landscape	12 sheets/min / 10 sheets/min / 9 sheets/min
B5 landscape	12 sheets/min / 10 sheets/min / 9 sheets/min
B4 (8½" x 14")	10 sheets/min / 9 sheets/min / 9 sheets/min
A3 (11" x 17")	8 sheets/min / 8 sheets/min / 8 sheets/min
Fast copy:	10 sec
Warm-up:	60 sec (Rated voltage, 20°C, 65%RH)
Continuous copy:	1 ~ 99 sheets (Keypad entry, count-down display) Automatic repeat, pause (multicopy possible during pause)
Magnification ratio:	1:0.50 to 1:2.00 (151 steps in 0.01 increment) (fixed ratio) AB series: 1:2.00, 1:1.41, 1:1.22, 1:1.15, 1:1.00, 1:0.86, 1:0.81, 1:0.70, 1:0.50 Inch series: 1:2.00, 1:1.41, 1:1.29, 1:1.21, 1:1.00, 1:0.95, 1:0.77, 1:0.64, 1:0.50
Exposure system:	Slit exposure with stationary platen, moving light source and variable light source illumination
Automatic exposure system:	Selected area exposure, light reflection measured in synchronization with the exposure operation without disturbing focal beam path.
Paper feed system:	Double cassette, manual feed • Applicable paper Weight: 56 ~ 80g/m^2 Sharp standard paper Size: A3 ~ B5 (11" x 17" ~ 8½" ~ 5½") Lower cassette: A4 (11" x 8½") • Applicable paper for manual feed Weight: 52 ~ 128g/m^2 (Papers of 105g/m^2 or more should be max. A4.) label paper, OHP, second original, Sharp standard postcard, coarse paper
Developing system:	Magnetic brush development (2 components, toner ⊕, carrier ⊖)
Photoconductor:	30ϕOPC drum
Cleaning system:	Blade cleaning
Paper separation system:	Separation pawls and separation corona (discharge plate)
Document alignment:	Center reference
Transport system:	Transport roller, suction belt
Corona charge system:	-DC corona
Image transfer system:	-DC corona
Discharge system:	Discharge lamp
Light source:	Halogen lamp 100V series 275W, 200V series 310W
Power source:	AC 100V 50/60Hz 110V 50/60Hz 120V 60Hz 127V 60Hz 200V 50Hz 220V 50/60Hz 240V 50Hz Operating voltage ±10% Operating frequency ±2%
Power consumption:	Max. 1.5KW including ADF, sorter and other options. Approx. 160W/h for standby.
Fusing system:	Heat roller, upper tension roller (heater lamp 850W), lower silicone roller
Dimensions:	700mm (W) x 610mm (D) x 400mm (H) (Glass surface)
Weight:	Approx. 50kg

Accessories

Part name	SF-7855/7830
Paper exit tray:	1
Instruction manual:	1
Installation manual:	1
Dust cover:	1
Corona cleaner:	1

* Dust cover is only for some areas only.

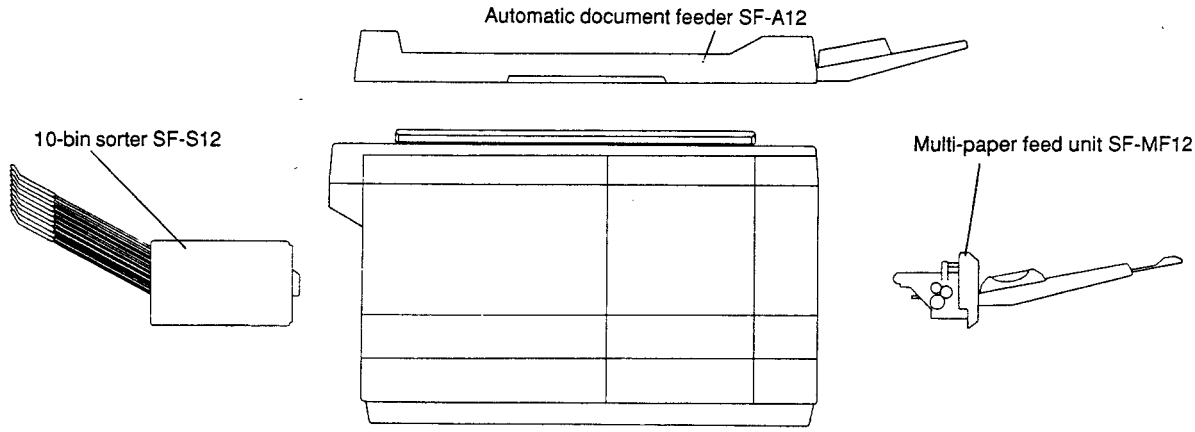
Options

Part name	
Automatic document feeder	SF-A12
10-bin sorter	SF-S12
Multi-paper feed unit	SF-MF12

[2] GENERAL

1. Features

1) 151-step zoom function
   151 steps of magnification or reduction ratios can be selected as well as 9 steps of fixed magnification ratios.
2) Front loading cassette (Universal type)
   The front-loading cassette reduces installation space requirements.
3) Photo copy mode
   A black and white or color photograph can be clearly copied with this feature.



2. System configuration (Options)

The SF-7855/7830 system is as follows:

Specifications of the options

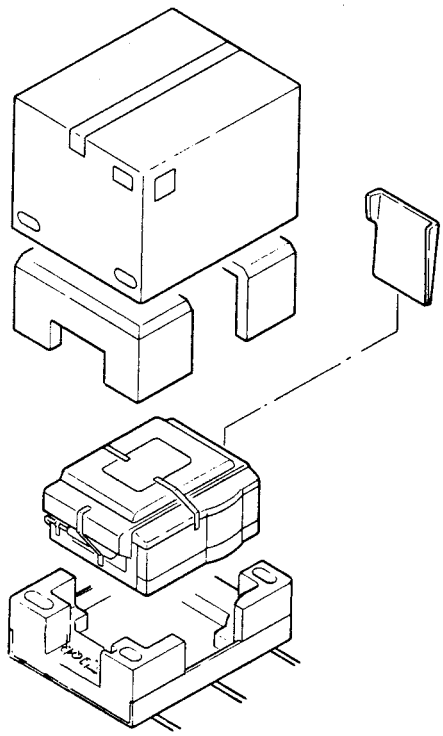
Name	Automatic document feeder SF-A12
Document feeding	Continuous, automatic feeding
Document exit	Reverse exit
Document transport	Single belt (center reference)
Document setting direction	Face down
Document size	A3 ~ A5 (A5 in landscape direction only) 11" x 17" ~ 8½" x 5½" (8½" x 5½" in portrait direction only)
Document weight	50g/m^2 ~ 120g/m^2
Document set capacity	Max. 50 sheets (50g/m^2 ~ 120g/m^2, Max. thickness 5mm)
Function	Document size detection
Power source	Supplied from the copier body.
Dimensions	948mm (W) x 517mm (D) x 72mm (H) (37.3" (W) x 20.4" (D) x 28" (H))

Name	10-bin sorter SF-S12
Bin number	10 bins
Receiving system	Face up
Copying capacity	Max. 25 sheets/min (A4)
Bin capacity	20 sheets/bin (The top bin: 100 sheets)
Paper size	Max.:A3 (11" x 17"), Min.:A6 (8½" x 5½")
Paper weight	52g/m^2 ~ 128g/m^2 (For the 2nd ~ 10th bin, 52g/m^2 ~ 90g/m^2)
Dimensions	418mm (W) x 462mm (D) x 225mm (H) (16.5" (W) x 18.2" (D) x 8.9" (H))
Weight	Approx. 7kg

Name	Multi-paper feed unit SF-MF12
Paper feed size	A3, B4, A4, A4R, B5, B5R, A6, postcard, 11" x 17" ~ 8½" x 5½"
Paper weight	50g/m^2 ~ 80g/m^2: Continuous feeding 52g/m^2 ~ 128g/m^2: Single paper feed (105g/m^2 or greater: A4 or smaller only)
Capacity	Max. 50 sheets (Sharp cassette standard paper), 20 sheets (Postcards)
Dimension	408mm (W) x 465mm (D) x 117mm (H) (16.1" (W) x 18.3" (D) x 4.6" (H))
Weight	Approx. 1.8kg

[3] UNPACKING AND INSTALLATION

1. Unpacking



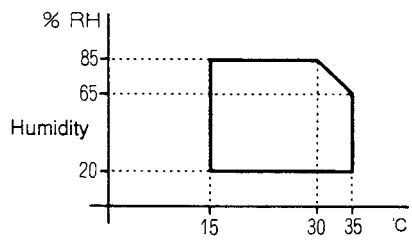
2. Installation conditions

The machine performance may be affected by the installation conditions. Please note the following requirements:

(1) Environment

① Avoid installation in direct sunlight or bright location near a window. (When installing near a window, draw the curtain and close the blind completely.)
Direct sunlight may cause the plastic components and the document cover to deform. Frosted glass may also produce the same effect.

② Avoid installation in a hot, damp place or where rapid changes in humidity occur. (for example; near an air conditioner).
This may cause paper to dampen or condensation to occur inside the copier, and may lead to a misfeed and a deterioration in copy quality.
The recommended environmental conditions are:
20 to 25 degrees C (68 to 77 degrees F), 65±5%RH
The operating environmental conditions
15 to 30 degrees C (59 to 80 degrees F), 20% ~ 85%RH (65%RH for 35 degrees C)



③ Avoid installation in a place where dust or vibration is encountered.
Dust deposit inside the copier may lead to a deterioration of copy quality or machine problem.

④ Avoid installation on an unstable surface. The copier must be placed on a level surface to perform proper operation.

⑤ Avoid installation in a place where ventilation or air circulation is poor.
The copier produces ozone during copying. The quantity of ozone produced is too small to give a bad influence on human health. However, when producing a large number of copies, ozone may smell. It is advisable to ventilate properly.

⑥ Avoid installation near inflammable materials or in the presence of ammonia fumes.
Installation near a diazo copy machine may lead to a deterioration of copy quality or a machine malfunction.

⑦ Install the copier near a power outlet.

(2) Space around the copier

Allow a clearance of 10cm between the rear side and the wall for ventilation of the cooling fan. The adequate working space around the copier is also required.

(3) Copier table

Install the machine on a level surface, using a water level (UKOGM0054CSZZ), to ensure the copier is level
(Note) If the copier is not level, the toner concentration control may malfunction, resulting in degraded copy.

(4) Power source

Avoid complex wiring.

(5) Ground connection

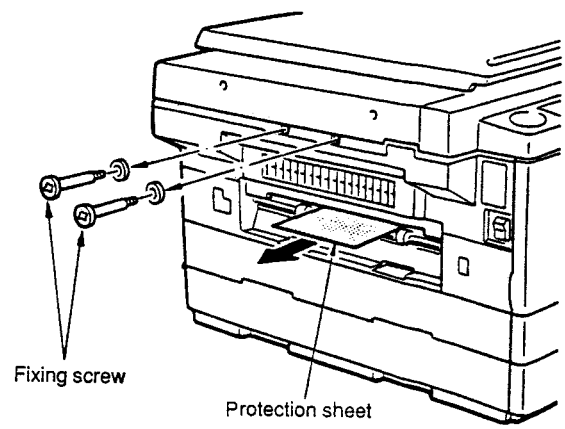
Be sure to ground the copier for prevention of accidents. A properly grounded outlet should be used.

3. Installation

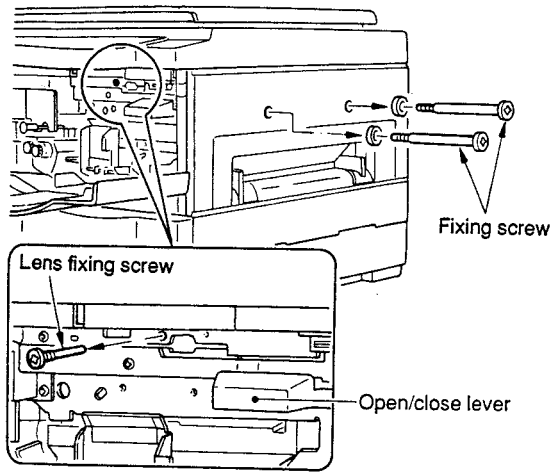
1) Releasing the optical system lock

① Remove the fixing screws (2 pcs.) of the No. 2, 3 mirror unit on the left side.

② Then, remove the protection sheet.

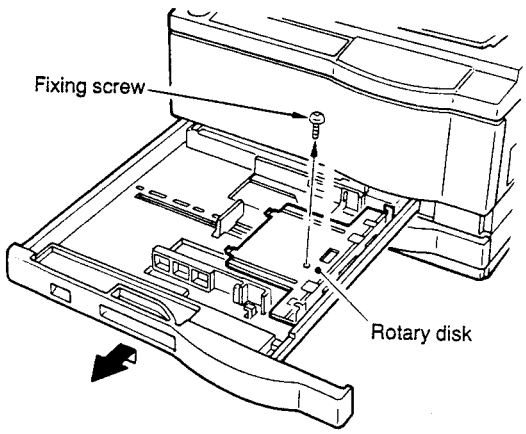


③ Remove the fixing screws (2 pcs.) of the No. 4, 5 mirror unit on the right side. Open the front cover, and remove the lens fixing screw under the operation panel.

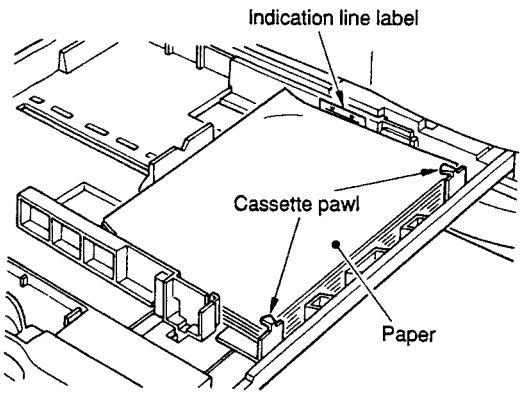


2) Releasing the 250-sheet cassette lock

① While lifting the front cassette lever, slowly pull it out until it stops. Remove the two package fixing screws which are fixing the rotary disk.



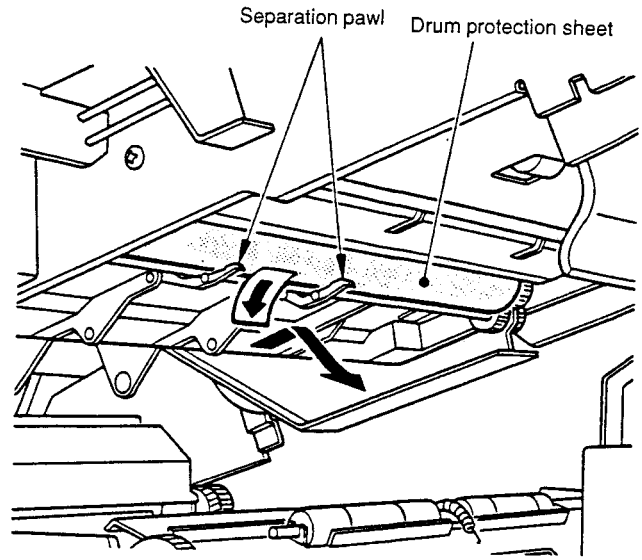
② Set paper in the front cassette so that the paper is placed under the cassette pawls (2 positions), and insert the cassette completely into the copier.



When shipping, the size is set to A3 (11" x 17"). When changing the size, be sure to change the paper side display.

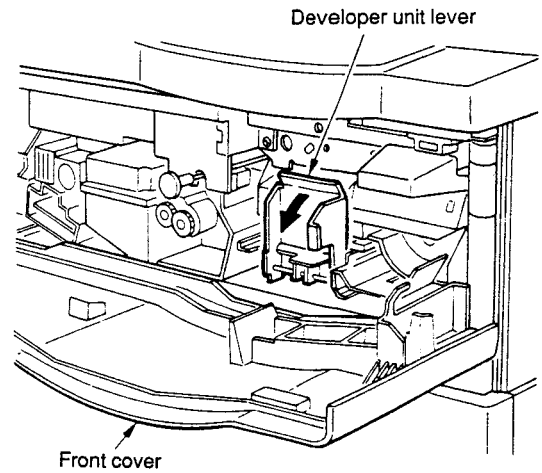
3) Drum setting

Push up the open/close lever and slowly open the upper unit. Remove the drum protection sheet from the photoconductor drum. Be careful not to scratch the photoconductor drum and the drum separation pawl.

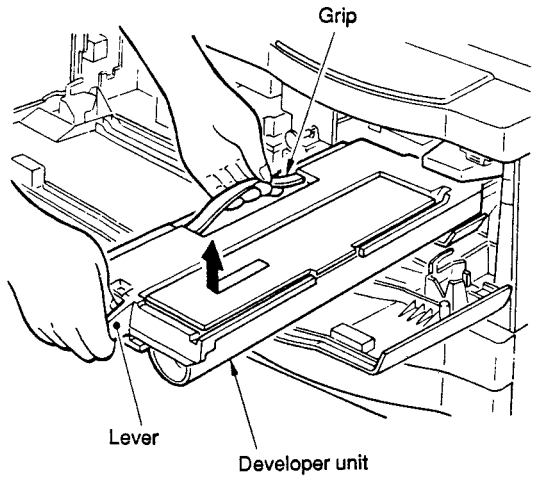


4) Setting the developer unit

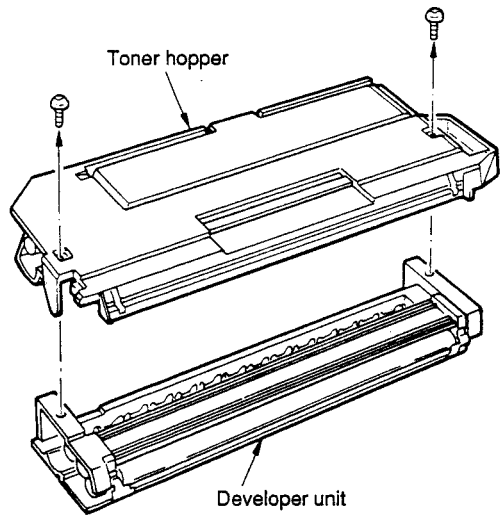
① Tilt down the developer unit lever, hold it and remove the developer unit until it stops.



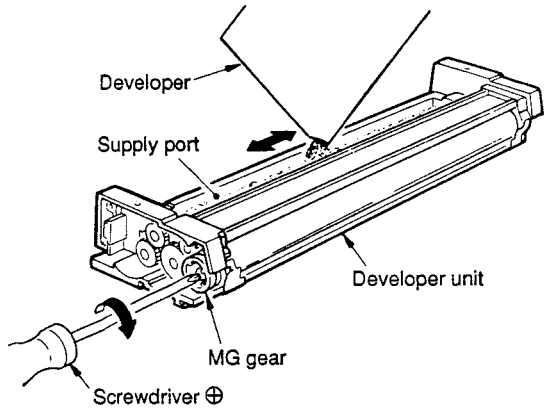
② Hold the grip of the developer unit and remove the developer unit. (Hold the grip upward to unlock the developer unit.)



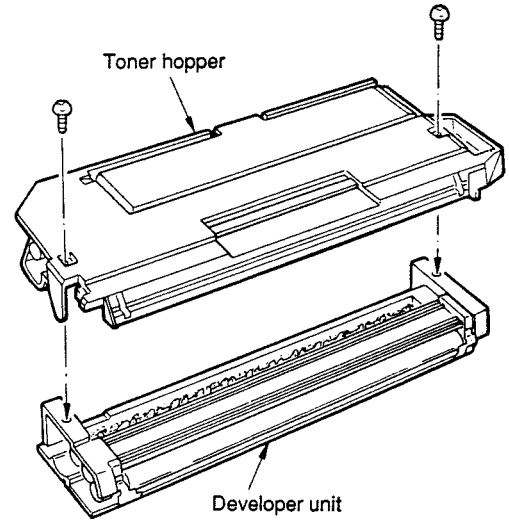
③ Remove the two fixing screws securing the toner hopper from the developer unit, and remove the toner hopper.



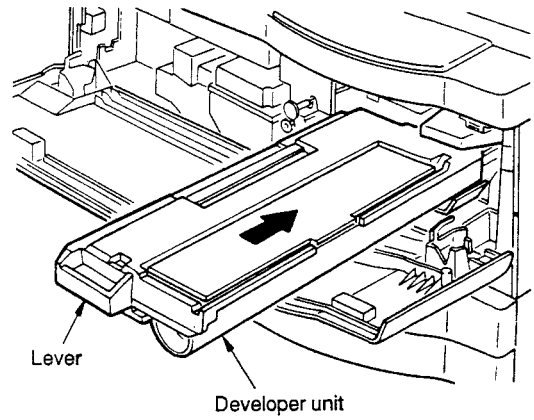
④ While supplying developer from the developer supply port of the developer unit, turn the MG gear clockwise with a screwdriver ⊕ to receive all developer inside the developer unit.



⑤ Fix the toner hopper to the developer unit with two fixing screws.



⑥ Insert the developer unit into the copier completely, lift the developer unit lever upward, and close the front cover.



5) Toner concentration sensor level adjustment

① Turn on the power switch.

② Perform test command 25 [CA].
[C] — [=J] — [0] — [=J] — [2] — [5] — [CA] — [PSW]

③ The interruption lamp lights up and the automatic toner concentration adjustment is performed.

④ Stir the developer unit for 2 minutes in the case of black or for 3 minutes in the case of monochrome. The concentration is displayed in the copy quantity display. (0 – 99)

⑤ After stirring, the concentration value is stored in the memory and the machine stops. If the concentration is outside the range of 0 – 99, "EE" is displayed.

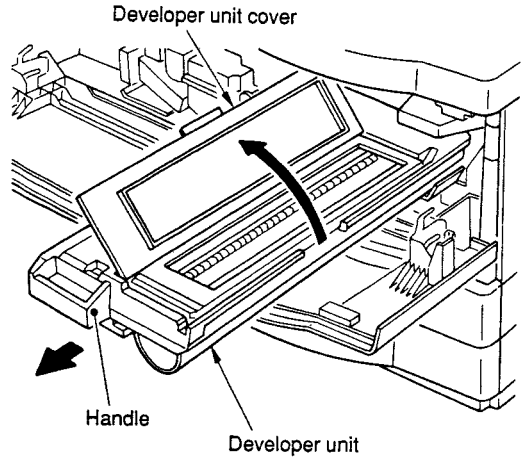
* For the details, refer to TEST FUNCTIONS AND SELF DIAGNOSIS.

When performing this test command, the color of the developer can be checked with the combination of the maintenance lamp, the jam lamp, and the developer lamp.

Color	Maintenance lamp	Jam lamp	Developer lamp
Black	ON	—	—
Red	—	ON	—
Blue	ON	ON	—
Brown	—	—	ON
Green	ON	—	ON

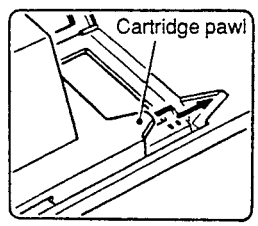
6) Toner supply

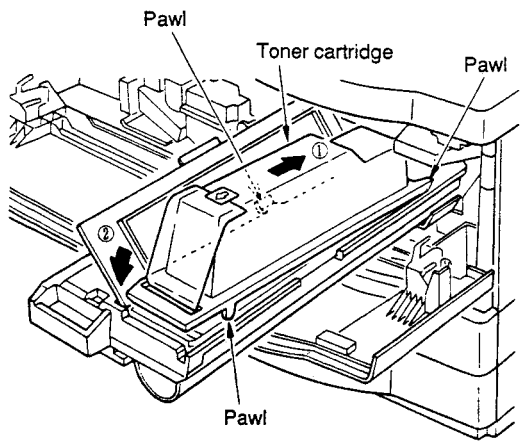
① Open the front cover.
Tilt down the developer unit lever, hold the handle of the developer unit and pull out the developer unit until it stops. Open the toner hopper cover.



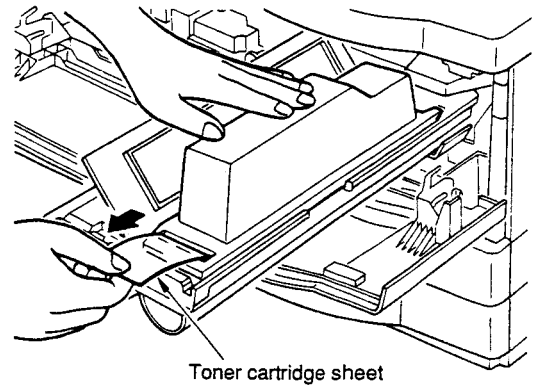
When supplying toner in the toner bottle:
Shake the bottle well and supply toner from the toner supply port.

② After shaking the toner cartridge several times, install the toner cartridge to the toner hopper.
Check that the toner cartridge pawl is securely engaged with the toner hopper.

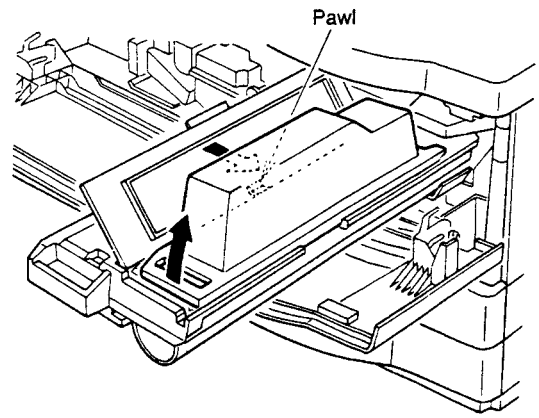




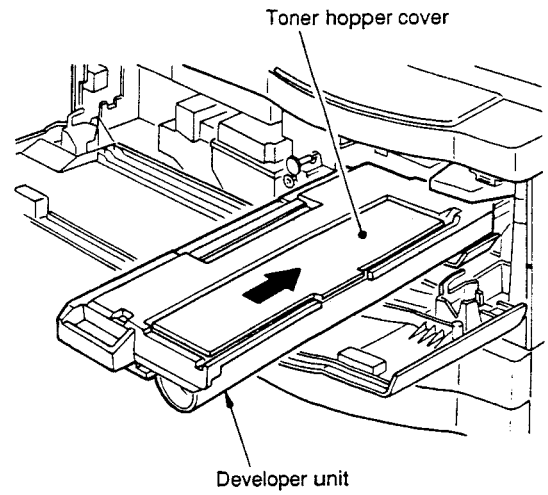
③ While pressing the toner cartridge, pull and remove the toner cartridge sheet to supply toner.
Tap the top of the toner cartridge several times to supply toner completely.
The toner cartridge sheet must be removed completely.



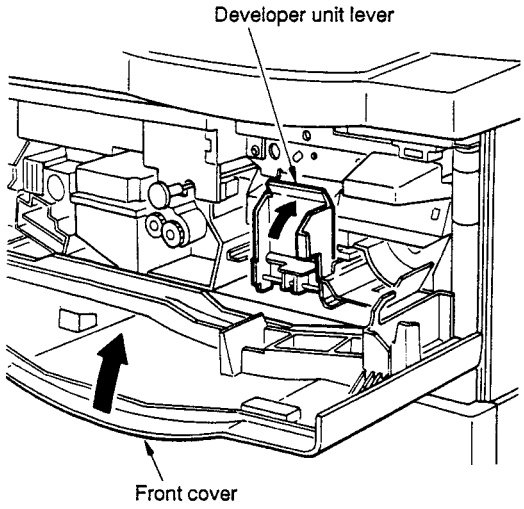
④ Hold the center of the toner cartridge and release the lock. Lift the toner cartridge upward to remove it.



⑤ Close the toner hopper cover, and insert the developer unit completely.

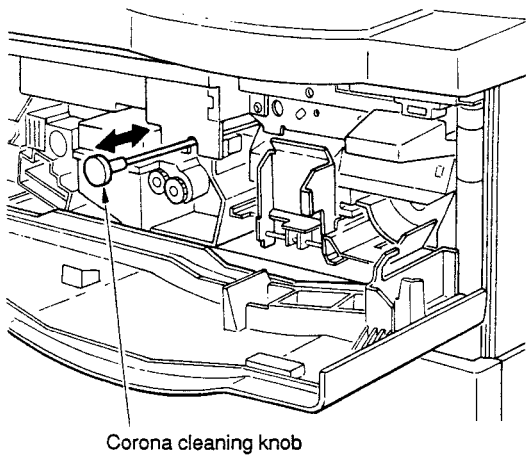


⑥ Close the developer unit level and the front cover.

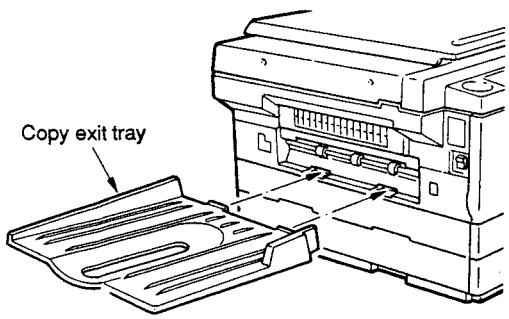


7) Corona wire cleaning

Slide the corona cleaning knob back and forth a few times and clean the corona wire.



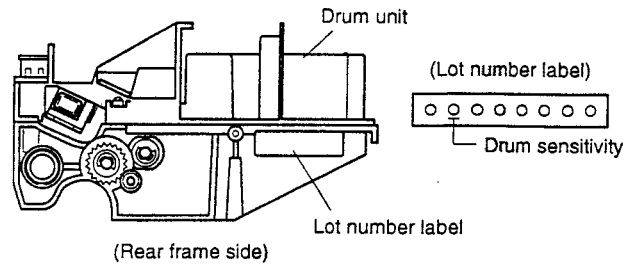
8) Accessory attachment



9) Drum sensitivity setting

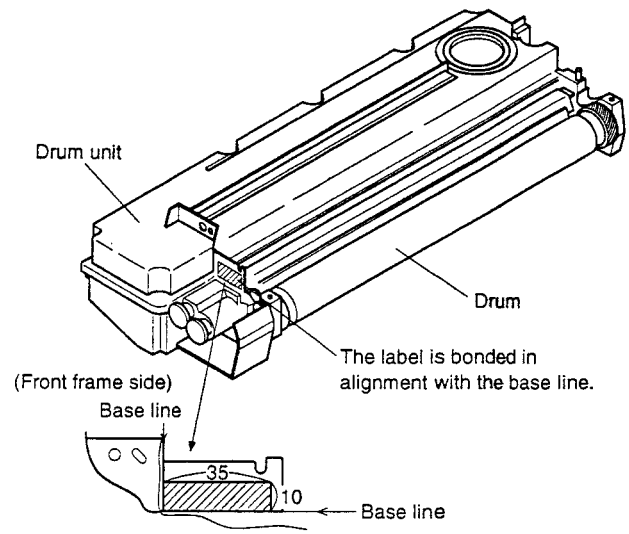
① Perform test command 45, and enter the sensitivity value on the sensitivity label which is located in the rear frame side of the drum unit.
Enter a first two digits of the cartridge lot number label as the drum sensitivity.

* No label is attached to the cartridge supplied with the machine because it had already been programmed.



① For you need to remove the drum from the cartridge in order to check the drum sensitivity of the drum that supplied with the machine, the lot number label is also attached to the drum that supplied with the machine with change in the label location to the front frame side.

* This change will be effective from December, 1990.



10) Automatic exposure copy mode level check

This check should be performed in the following cases:

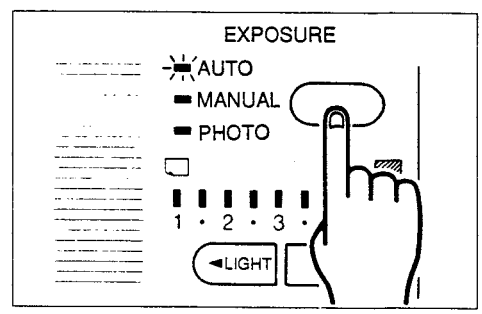
- When the machine is installed.
- When maintenance is performed.
- When copy exposure is adjusted.

Checking procedure

① Press the exposure select key to select the photo mode.

② Press the exposure select key again to select the automatic exposure mode, and keep pressing the key for 5 sec.

- When the automatic exposure level adjustment mode is attained, the automatic exposure display lamp blinks (from lighting state). The exposure adjustment display lamp lights up. (Either of 1 – 5.)



③ Check that the lamp of "3" lights up.
If another lamp than "3" lights up, use the exposure adjustment key to light the lamp of "3".

④ Press the exposure select key to cancel the automatic exposure level adjustment mode.
The exposure display lamp goes off and the automatic exposure display lamp lights up (from blinking state).

11) Copy check

Use a test chart to perform copy check. For a to c, use UKOG-0089CSZZ. For d, use UKOG-0089CSZZ, Kodak gray scale or UKOG-0162FCZZ.

a. Center deviation

Allowable deviation: Within 2.0mm
If not within the allowable range, adjust referring to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENTS page 7-19.

b. Lead edge void area and lead edge image loss

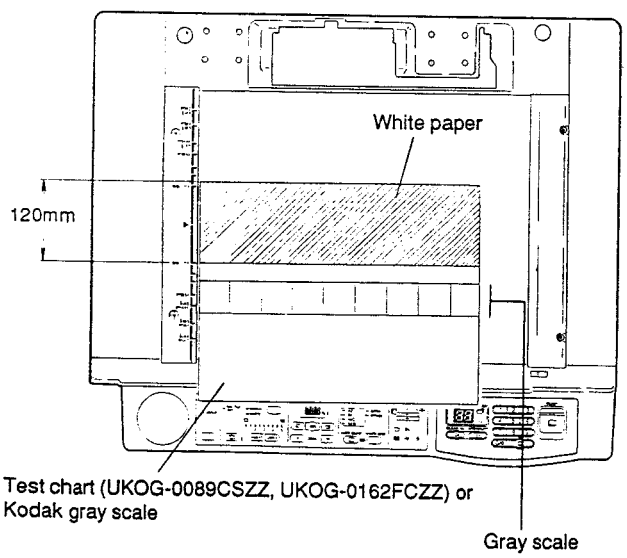
Allowable range:
Lead edge void area; 1.0 ~ 3.0mm
Lead edge image loss; 0 ~ 3.0mm
If not within the allowable range, adjust referring to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENTS page 7-20.

c. Resolution

Allowable range: In normal copy, 5.0 lines/mm at the center, 4.5 lines/mm at the corners.
If not within the allowable range, adjust referring to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENTS page 7-14.

d. Copy exposure

Place four sheets of white paper of about 120mm wide and 420mm long on the document table in center reference. Set a test chart (UKOG-0089CSZZ, UKOG-0162FCZZ) or Kodak gray scale on the papers as shown below:



① Use the above chart to check manual exposure 1 and 5.
The reference exposure for each chart is as follows:
When UKOG-0089CSZZ is used:
Exposure 1; 0.5 is slightly copied.
Exposure 5; 0.1 is slightly copied and 0.2 is clearly copied.
When UKOG-0162FCZZ is used:
Exposure 1; 7 is slightly copied and 8 is clearly copied.
Exposure 5; 1 is not copied and 2 is slightly copied.
When Kodak gray scale is used:
Exposure 1; 3 is not copied and 4 is clearly copied
Exposure 5; A is not copied and 1 is clearly copied

② Check the photo mode exposure in the same manner as the manual exposure check. The reference exposure is same as the reference manual exposure.

③ Check the automatic exposure mode. The reference exposure for each chart is as follows:
When UKO-0089CSZZ is used: 0.2 is slightly copied and 0.3 is clearly copied.
When UKOG-0162FCZZ is used: 2 is not copied and 3 is slightly copied.
When Kodak gray scale is used: 1 is slightly copied and 2 is clearly copied.
For adjustment procedure, refer to [11] COPY EXPOSURE ADJUSTMENT.

12) Mini maintenance counter setting

Setting procedure

① Perform test command 72.
[C] — [=J] — [0] — [=J] — [7] — [2] — [PSW]
The currently set maintenance cycle code (in the table below) is displayed and the ready lamp lights up.

② After the ready lamp lights up, enter the set code corresponding to the maintenance cycle code.

Maintenance preset counter setting

Set code	Developer lamp		Maintenance lamp
	Black	Monochrome	
0	30,000 sheets	10,000 sheets	10,000 sheets
1	30,000 sheets	10,000 sheets	15,000 sheets
2	30,000 sheets	10,000 sheets	30,000 sheets
3	Not lighted	10,000 sheets	Not lighted.

13) Option setting

When any option is installed, perform the test command according to the option.

Setting procedure

① Perform test command 80.
[C] — [=J] — [0] — [=J] — [8] — [0] — [PSW]

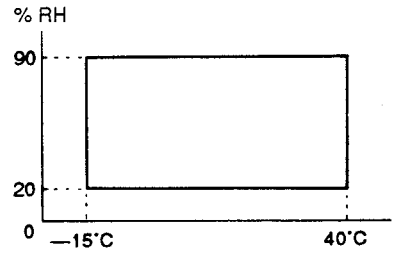
② Calculate the total of the set code of the options installed, and set the total number.

Option mode set value

Option	Model	Code
ADF	SF-A12	1
Multi-paper feed unit	SF-MF12	4
Sorter	SF-S12	20

[4] SUPPLIES

Developer, toner, drum life

	Life	Storage period	Storage conditions
Drum	30,000 copies	24 months from production	
Developer	Black: 30,000 copies Red, Blue, Brown, Green: 10,000 copies	24 months from production	
Toner	Each color: 5,000 copies (210g each) * A4/letter size, 6% black background	24 months from production	

How to identify the lot number

Drum (front side of flange)

○ ○ ○ ○ ○ ○ ○ ○ ○
1 2 3 4 5 6 7 8 9

1. Drum sensitivity
2. Model code (L)
3. The last digit of year
4. Month (123 ··· XYZ) } OPC coating date
5: 6: Day (10 11 12) } OPC coating date
7. Month (123 ··· XYZ) } Drum/flange assembling date
8: 9: Day (10 11 12) } Drum/flange assembling date

Toner, developer

○ ○ ○ ○ ○ ○ ○ ○
1 2 3 4 5 6 – 7

1: Drum sensitivity
2: The last digit of year
3: 4: Production month
5: 6: Production day
7: Lot number

Drum cartridge

○ ○ ○ ○ ○ ○ ○ ○
1 2 3 4 5 6 7 8

1: The last digit of year
2: Drum sensitivity (1~3)
3: 4: 5: 6: 7: Serial number
With machine 50001~
As supply 00001~
8: Production month (1,2,3~0,X,Y) (11 12)

For U.S.A. and Canada

Name	Content	Life	Sharp model name	Packing unit	Remark
Drum unit	OPC drum including separation sub-pawl, cleaning blade, toner receiver, waste toner container.	30K	SF-780DR	10	Unit composition including the waste toner container.
Developer (Black)	Developer (550g) x 10 (Aluminum package)	30K (x 10 pcs.)	SF-780MD1	1	SF-780ND1 x 10 = SF-780MD1 Ordering unit: SF-780MD1
Developer (Red) (Blue) (Brown) (Green)	Developer (550g) x 10 (Bottle) Red: SF-780ND2 Blue: SF-780ND3 Brown: SF-780ND4 Green: SF-780ND5	10K (x 10 pcs.)	SF-780MD2 SF-780MD3 SF-780MD4 SF-780MD5	1	(SF-780ND2 ~ 5) x 10 = (SF-780MD2 ~ 5) Ordering unit: SF-780MD2 ~ 5
Toner	Toner (210g) x 10 (Cartridge)	5K (x 10 pcs.)	SF-780MT1	1	(SF-780NT1) x 10 = (SF-780MT1) Ordering unit: SF-780MT1
Toner	Toner (210g) x 10 (Cartridge) Red: SF-780NT2 Blue: SF-780NT3 Brown: SF-780NT4 Green: SF-780NT5	5K (x 10 pcs.)	SF-780MT2 SF-780MT3 SF-780MT4 SF-780MT5	1	(SF-780NT2 ~ 5) x 10 = (SF-780MT2 ~ 5) ~ Ordering unit: SF-780MT2 ~ 5
Color developer kit	Developer (550g) x 1 Toner cartridge (210g) x 1 Developer unit x 1 Storage case		SF-780NK2 SF-780NK3 SF-780NK4 SF-780NK5	1	
Heat roller kit	Upper/lower heat roller x 1 each Separation pawl, upper x 4, lower x 3 Cleaning roller x 1	60K	SF-780HR	5	

For Europe

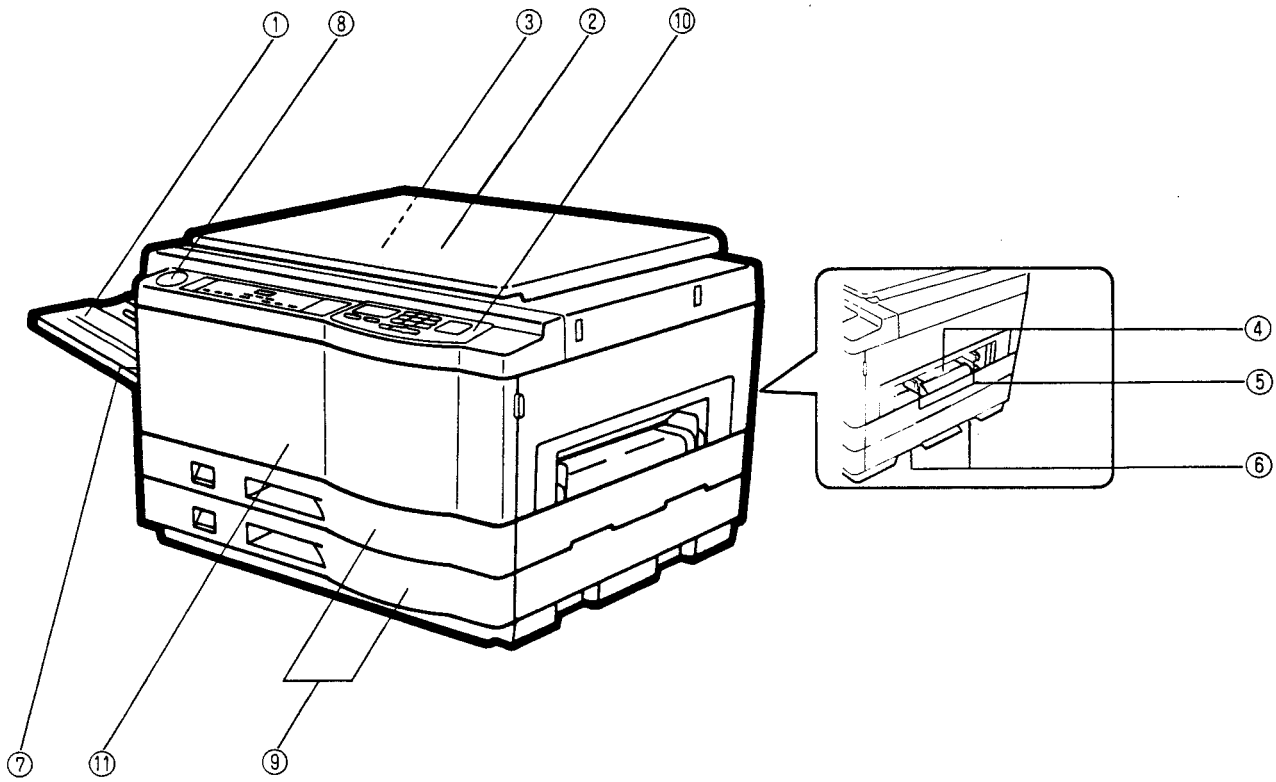
Name	Content	Life	Sharp model name	Packing unit	Remark
Drum unit	OPC drum including separation sub-pawl, cleaning blade, toner receiver, waste toner container.	30K	SF-780DR	10	Unit composition including the waste toner container.
Developer (Black)	Developer (550g) x 10 (Aluminum package)	30K (x 10 pcs.)	SF-780LD1	1	SF-780DV1 x 10 = SF-780LD1 Ordering unit: SF-780LD1
Developer (Red) (Blue) (Brown) (Green)	Developer (550g) x 10 (Bottle) Red: SF-780DV2 Blue: SF-780DV3 Brown: SF-780DV4 Green: SF-780DV5	10K (x 10 pcs.)	SF-780DV2 SF-780DV3 SF-780DV4 SF-780DV5	10	Ordering unit: SF-780DV2 ~ 5
Toner	Toner (210g) x 10 (Cartridge)	5K (x 10 pcs.)	SF-780CT1	1	(SF-780ST1) x 10 = (SF-780CT1) Ordering unit: SF-780CT1
Toner	Toner (210g) x 10 (Cartridge) Red: SF-780T2 Blue: SF-780T3 Brown: SF-780T4 Green: SF-780T5	5K (x 10 pcs.)	SF-780T2 SF-780T3 SF-780T4 SF-780T5	10	Ordering unit: SF-780T2 ~ 5
Color developer kit	Developer (550g) x 1 Toner cartridge (210g) x 1 Developer unit x 1 Storage case		SF-780K2 SF-780K3 SF-780K4 SF-780K5	1	
Heat roller kit	Upper/lower heat roller x 1 each Separation pawl, upper x 4, lower x 3 Cleaning roller x 1	60K	SF-780HR	5	

For other countries

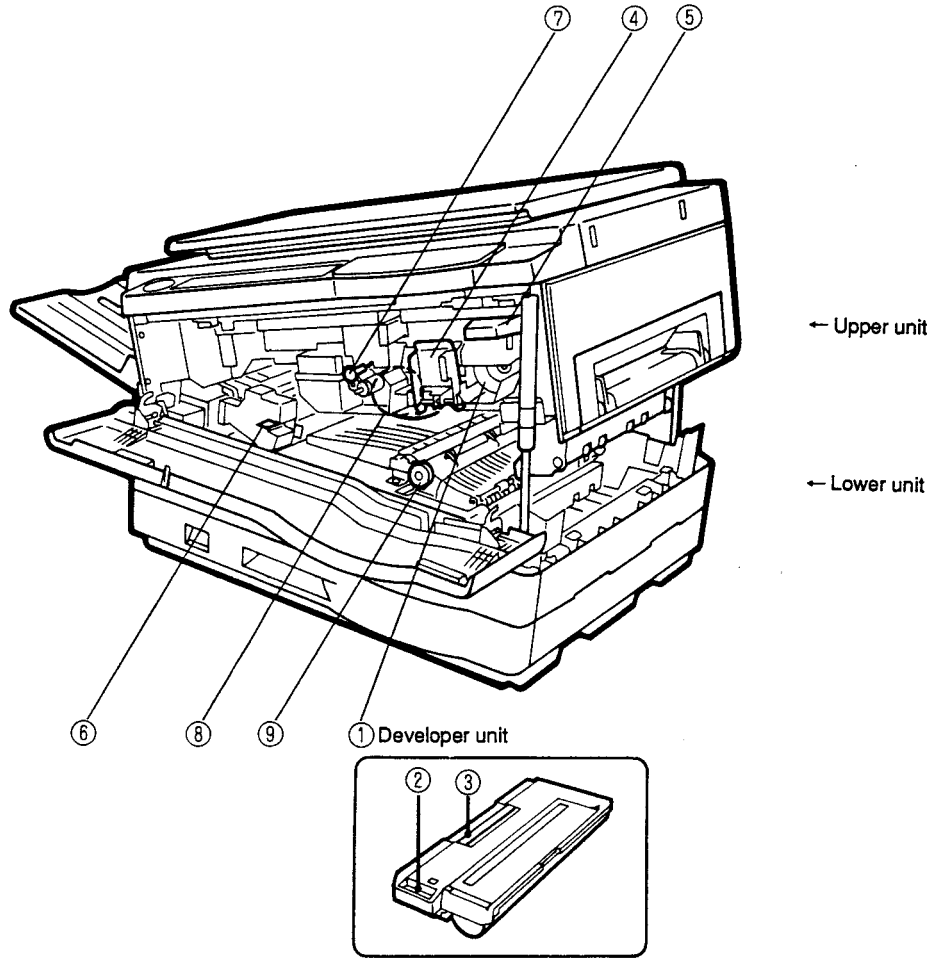
Name	Content	Life	Sharp model name	Packing unit	Remark
Drum unit	OPC drum including separation sub-pawl, cleaning blade, toner receiver, waste toner container.	30K	SF-780DR	10	Unit composition including the waste toner container.
Developer (Black)	Developer (550g) x 10 (Aluminum package)	30K (x 10 pcs.)	SF-780MD1	1	SF-780ND1 x 10 = SF-780MD1 Ordering unit: SF-780MD1
Developer (Red) (Blue) (Brown) (Green)	Developer (550g) x 10 (Bottle) Red: SF-780ND2 Blue: SF-780ND3 Brown: SF-780ND4 Green: SF-780ND5	10K (x 10 pcs.)	SF-780MD2 SF-780MD3 SF-780MD4 SF-780MD5	1	(SF-780ND2 ~ 5) x 10 = (SF-780MD2 ~ 5) Ordering unit: SF-780MD2 ~ 5
Toner	Toner (210g) x 10 (Cartridge)	5K (x 10 pcs.)	SF-780MT1	1	(SF-780NT1) x 10 = (SF-780MT1) Ordering unit: SF-780MT1
Toner	Toner (210g) x 10 (Cartridge) Red: SF-780NT2 Blue: SF-780NT3 Brown: SF-780NT4 Green: SF-780NT5	5K (x 10 pcs.)	SF-780MT2 SF-780MT3 SF-780MT4 SF-780MT5	1	(SF-780NT2 ~ 5) x 10 = (SF-780MT2 ~ 5) Ordering unit: SF-780MT2 ~ 5
Color developer kit	Developer (550g) x 1 Toner cartridge (210g) x 1 Developer unit x 1 Storage case		SF-780NK2 SF-780NK3 SF-780NK4 SF-780NK5	1	
Heat roller kit	Upper/lower heat roller x 1 each Separation pawl, upper x 4, lower x 3 Cleaning roller x 1	60K	SF-780HR	5	

[5] EXTERNAL AND INTERNAL STRUCTURE

1. External structure



①	Copy tray	②	Document cover	③	Document table
④	Manual paper feed port	⑤	Manual paper feed guide	⑥	Carry handle
⑦	Power switch	⑧	Clip tray	⑨	Cassette
⑩	Operation panel	⑪	Front cover		



①	Developer unit	②	Developer unit handle	③	Carry strap
④	Developer unit lever	⑤	Main body open/close lever	⑥	Fuser unit open/close knob
⑦	Corona cleaning knob	⑧	Photoconductor drum	⑨	Roller rotating knob

2. Operation panel

① Sorter key/indicator
Used to select the sorter modes and the group mode. The indicator corresponding to the selected mode lights up.

② Exposure select key/indicator
Used to select the exposure mode: Auto/Manual/Photo.

③ LIGHT and DARK keys/indicators
Used to adjust the manual or photo exposure level.
Pressing the LIGHT key moves the indicator to the left, and pressing the DARK key moves the indicator to the right.

④ Copy magnification ratio indicator
Displays the copy magnification ratio for enlargement or reduction.

⑤ Reduction key
Used to sequentially select four preset reduction ratios.

⑥ Zoom keys
Use to select any enlargement or reduction copy magnification ratio from 50% to 200% in 1% increment.

⑦ Same-size key
Resets the copy magnification ratio to 100%.

⑧ Enlargement key
Used to sequentially select four preset enlargement copy magnification ratio.

⑨ Paper size select key
Used to select copy paper size.

⑩ Cassette/misfeed position indicator
The (■) lamp lights up to indicate the selected cassette, and the (▼) lamp blinks to indicate the paper jam position.

⑪ Color toner indicator
Lights up when a color developer unit is installed.

⑫ Misfeed indicator
Blinks when a paper jam occurs.

⑬ Mini maintenance indicator
Lights up when the mini maintenance is required.

⑭ Toner empty indicator
Lights up when toner in exhausted.

⑮ Maintenance indicator
Lights up when maintenance is required.
Blinks whe waste toner full is detected.

⑯ Copy quantity display
- Displays the set copy quantity or finished copy quantity.
- When the diagnostic function is active, an error code is displayed.
- "[P]" blinks when paper is exhausted or paper is jammed in the cassette section.
  [P] lights up when the cassette is removed.

⑰ CLEAR ALL key
Clears all settings and returns the copier to the initial settings.

Standard state	
• Magnification ratio	= 100% (Normal size)
• Copy exposure	= Auto copy exposure mode
• Copy quantity display	= 0
• Interruption copy	= Cancel
OSorter (Option) installation	= Non-sort state

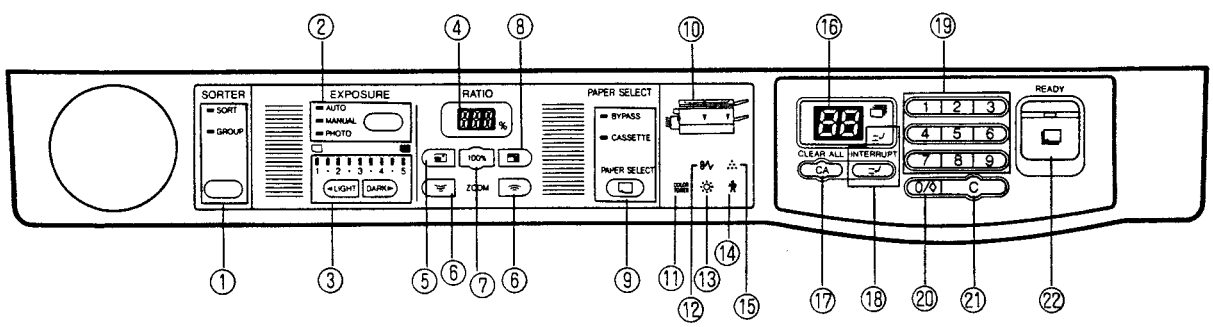
⑱ INTERRUPT key/indicator
Used to interrupt a continuous copy operation for making another copy. Also called pause (P).

⑲ Keypad
Used to select the desired copy quantity.

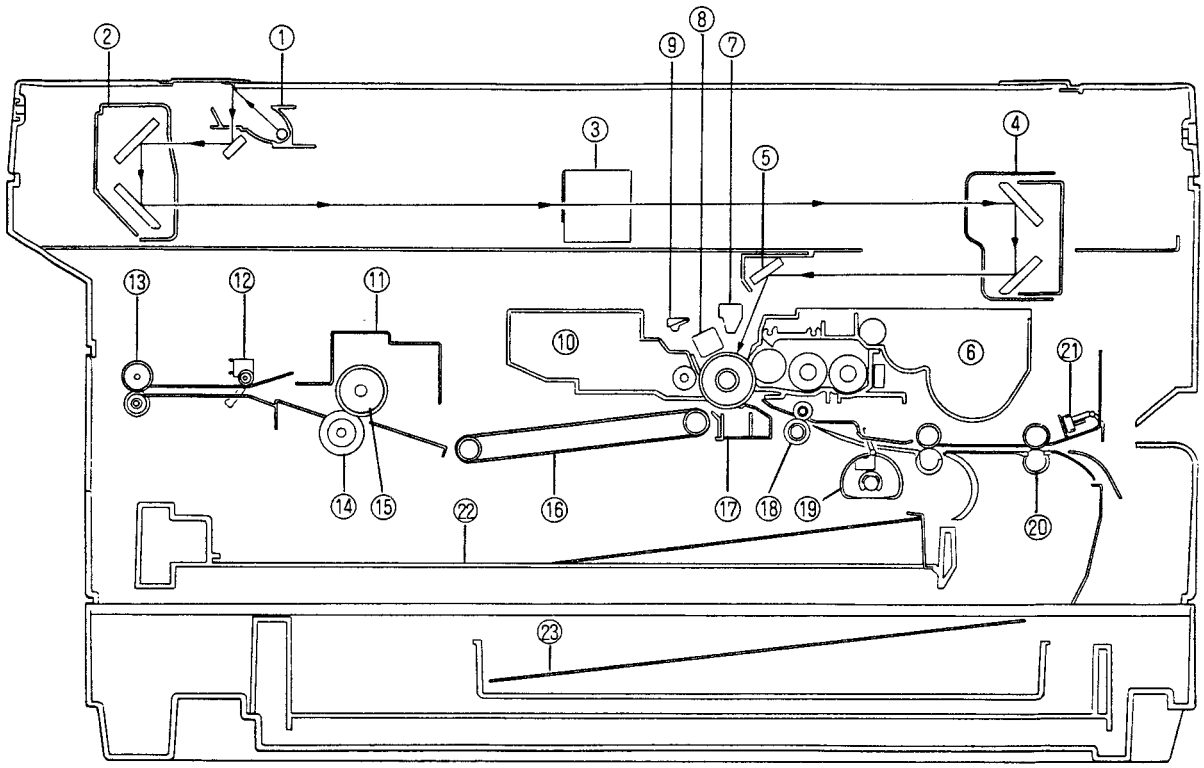
⑳ Zero/readout key
- Enters 0 when specifying the copy quantity.
- When this key is pressed and held during continuous copy operation, the number of copies completed is displayed while it is pressed. When this key is pressed in the other mode than continuous copy operation, the total; number of copies completed is displayed.

㉑ Clear key
Clears the copy quantity display or terminates a continuous copy operation.

㉒ COPY button (PSW) Print key
When the machine is ready to copy, the indicator in the button lights up. Press the button to start copying.

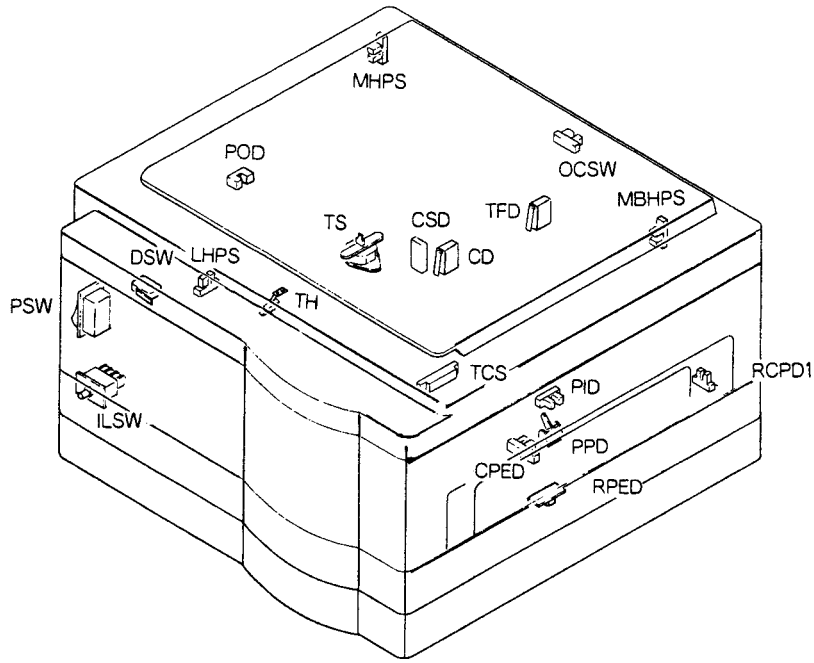


3. Internal structure



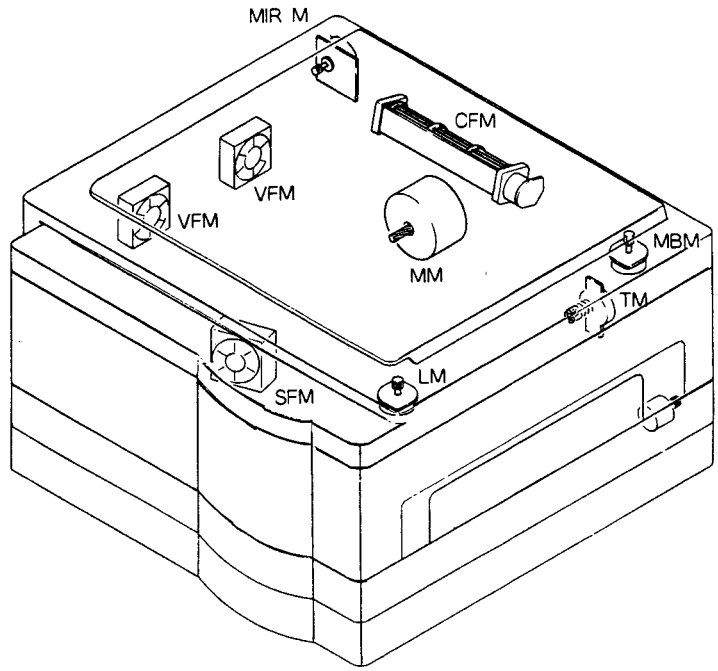
①	Copy lamp unit (Mirror base A)	②	No. 2/3 mirror base unit (Mirror base B)	③	Lens
④	No. 4/5 mirror base unit (Mirror base C)	⑤	No. 6 mirror	⑥	Developer unit
⑦	Blank lamp unit	⑧	Main corona	⑨	Discharge lamp unit
⑩	Waster toner box	⑪	Fuser unit	⑫	Paper exit detector (POD)
⑬	Paper exit roller	⑭	Fuser roller lower	⑮	Fuser roller upper
⑯	Suction unit	⑰	TC case unit	⑱	Resist roller
⑲	Paper feed roller 250	⑳	Transport roller S	㉑	Manual paper entry detector (PID)
㉒	250-sheet cassette	㉓	250 sheet cassette		

4. Switches, sensors, and detectors



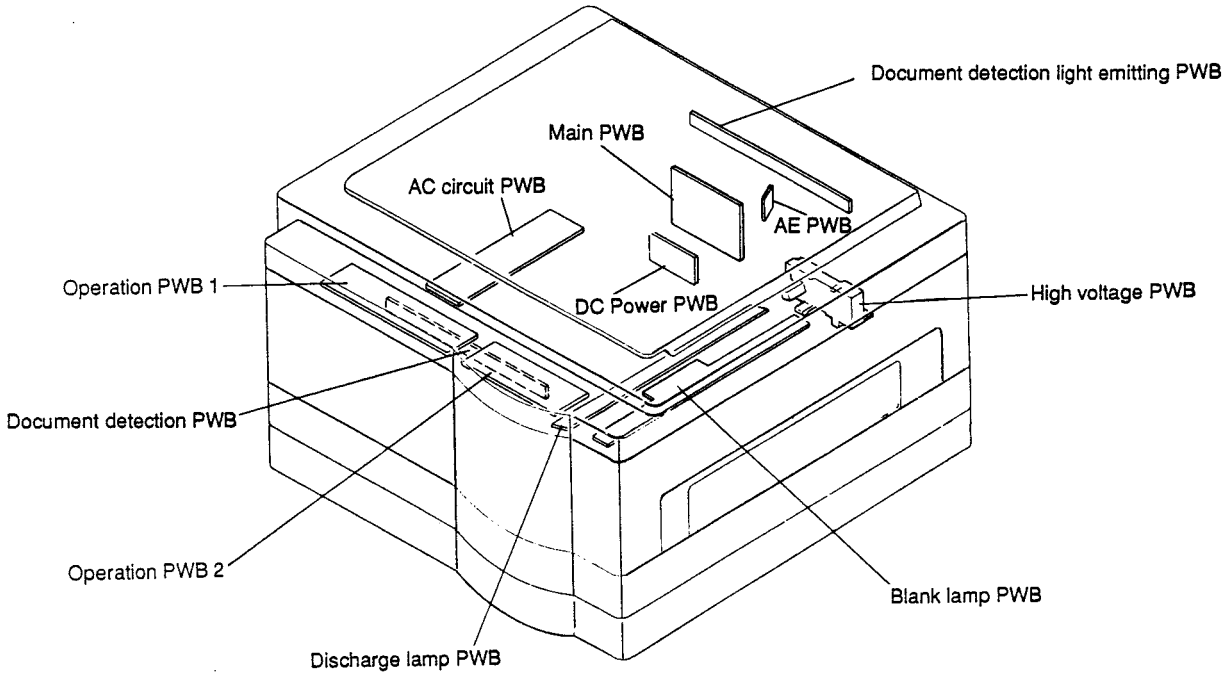
Code	Name	Type	Function	Output
MHPS	Mirror home position sensor	Transmission photosensor	Mirror base A (Copy lamp unit) home position detection	HIGH level when detected.
OCSW	Original cover switch	Transmission photosensor	Document cover open/close detection	HIGH level when detected.
MBHPS	Mirror base home position sensor	Transmission photosensor	No. 4/5 mirror base (Mirror base C) home position detection	HIGH level when detected.
LHPS	Lens home position sensor	Transmission photosensor	Lens home position sensor	HIGH level when detected.
DSW	Door switch	Microswitch	Front cover open/close switch	LOW level when closed.
PID	Paper in detector	Transmission photosensor	Manual paper feed detection switch	When paper is detected.
PPD	Paper pass detector	Transmission photosensor	Paper feed unit paper pass detection switch	HIGH level when paper is detected.
CPED	Upper cassette paper empty detector	Transmission photosensor	Upper cassette paper empty detection	HIGH level when paper empty.
RPED	Cassette paper empty detector	Reflection photosensor	Lower cassette paper empty detection	LOW level when paper empty.
RCPD1	Lower cassette detector 1	Transmission photosensor	Lower cassette detection	HIGH level when detected.
TCS	Toner control sensor	Magnetic sensor	Developer unit toner control sensor	HIGH level when toner concentration becomes low.
TFD	Toner full detector	Microswitch	Waste toner full detection	HIGH level when toner full is detected.
CD	Cassette detector	Microswitch	Cassette switch	HIGH level when detected.
CSD	Cassette size detector	Special switch	Cassette size detection switch	—
TS	Thermostat	Thermostat	Fuser unit high temperature detection	Contact open when abnormally high temperature is detected.
THE	Thermistor	Thermistor	Fuser unit temperature control	Resistance becomes greater when low temperature is detected.
POD	Paper out detector	Transmission photosensor	Paper exit detection switch	LOW level when detected.
PSW	Power switch	See-saw switch	Power switch	—
ILSW	Interlock switch	Interlock switch	Front cabinet open/close switch	ON when closed.

5. Motors



Code	Name	Type	Function
MIRM	Mirror motor	DC brushless motor	To feed and return mirror bases A, B.
CFM	Cooing fan motor	DC brushless motor	Cooling fan in the machine. ON when copying
MBM	Mirror base motor	Stepping motor	To drive No. 4/5 mirror bases.
TM	Toner motor	Synchronous motor	To supply toner.
LM	Lens motor	Stepping motor	To drive the lens
VFM1,2	Ventilation fan motor	Brushless motor	Ventilation fan in the machine (The speed is reduced when in warming up or in stand-by mode.)
SFM	Suction fan motor	Brushless motor	Paper suction motor
MM	Main motor	AC synchronous motor	To drive each section.

6. PWB's

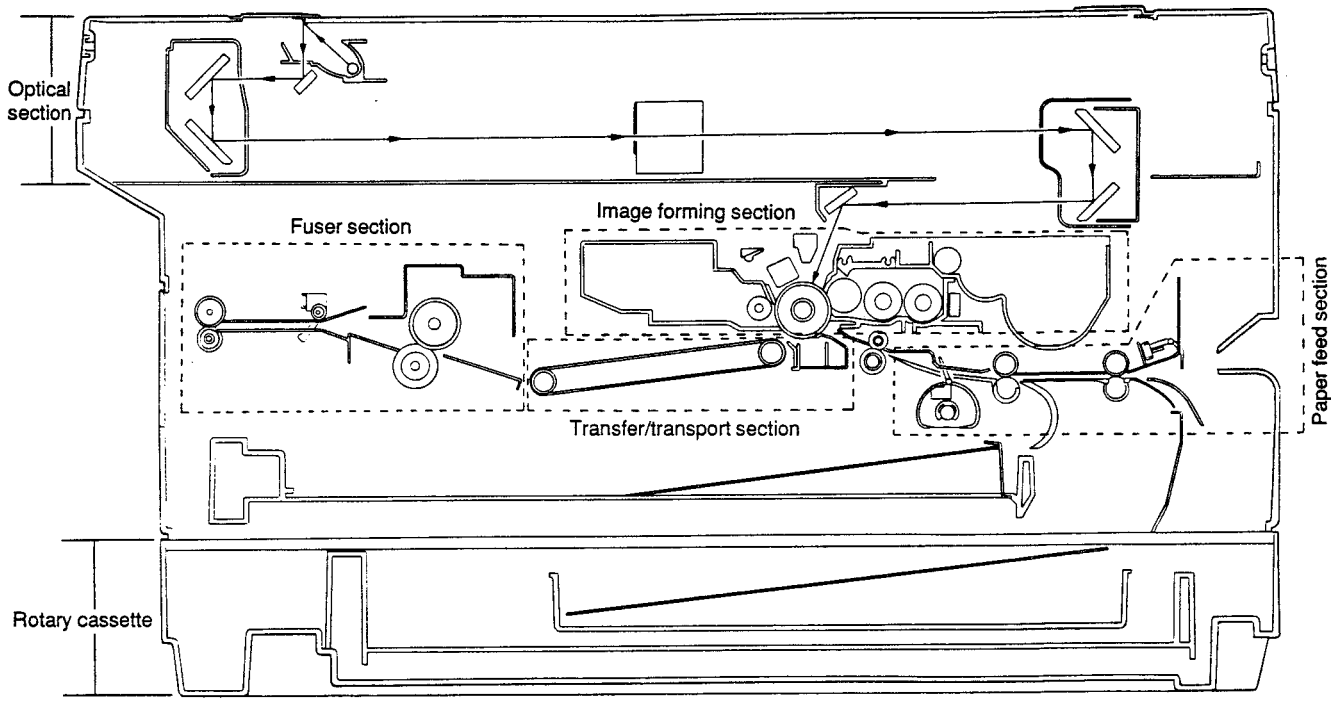


Name	Difference between	Remark
Main PWB	Different	
DC power PWB	Same	
High voltage PWB	Same	
Blank lamp PWB	Same	
AE PWB	Same	
Document detection light receiving PWB	—	
Document detection light emitting PWB	—	
Discharge lamp PWB	Same	
Operation PWB 1	Different	
Operation PWB 2	Same	
AC circuit PWB	Same	Includes the copy lamp control circuit.

[6] DESCRIPTION ON EACH SECTION

This machine is composed of the optical section, the paper feed section, the transfer/transport section, the fusing section, the image forming section, and the rotary cassette section

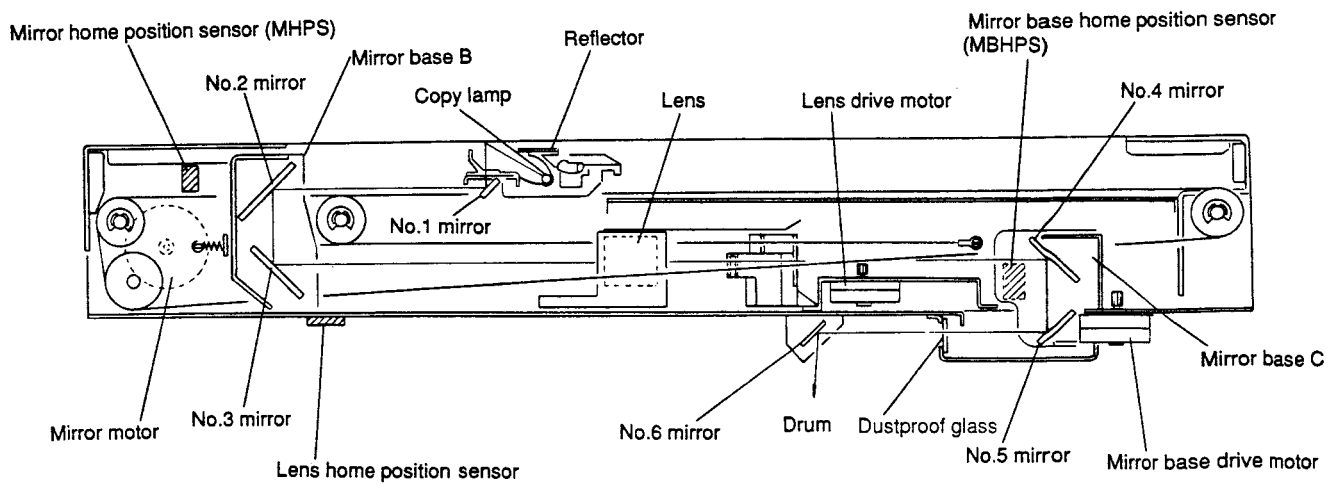
Cross section



1. Optical system

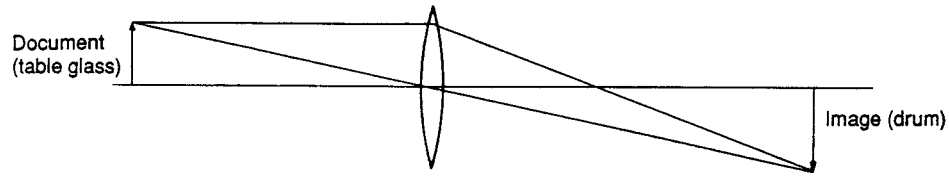
The optical system consists of a fixed focal distance lens and six mirrors.
Because the lens position is shifted relative to the mirrors, reduction and enlargement is possible from x50% to x200% in 151 increments of 0.01.
The lens position relative to the mirror is changed by means of a stepping motor. The reason six mirrors are used is to adjust the optical path to the internal mechanism which permits a smaller internal structure. Exposure is controlled electronically by varying the intensity of the copy lamp. The voltage applied to the copy lamp is stabilized to enhance uniform exposure.
A slit exposure and moving light source are used in combination with a stationary document exposure table.

Optical system cross sectional view

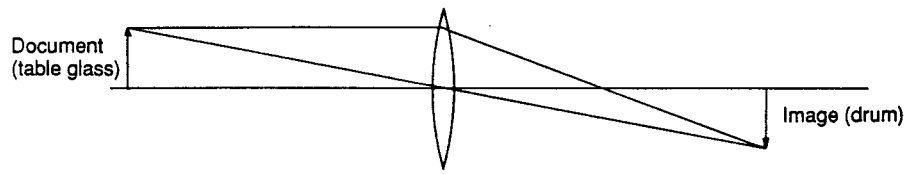


Relation of document. lens, vs. image in each magnification ratio

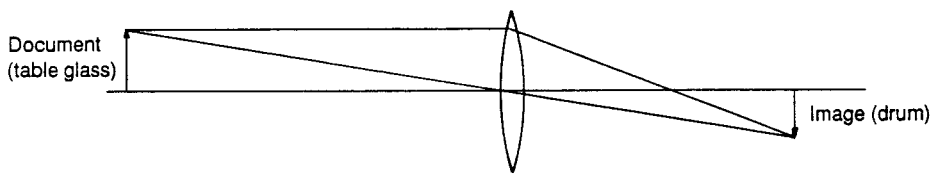
In the enlargement mode, as compared to the 1:1 or normal mode, the lens shifts closer to the document. The table glass distance becomes shorter. The No. 4 and No. 5 mirrors (mirror base C) move away from the lens, increasing the lens to image distance. This increases the object to image distance.

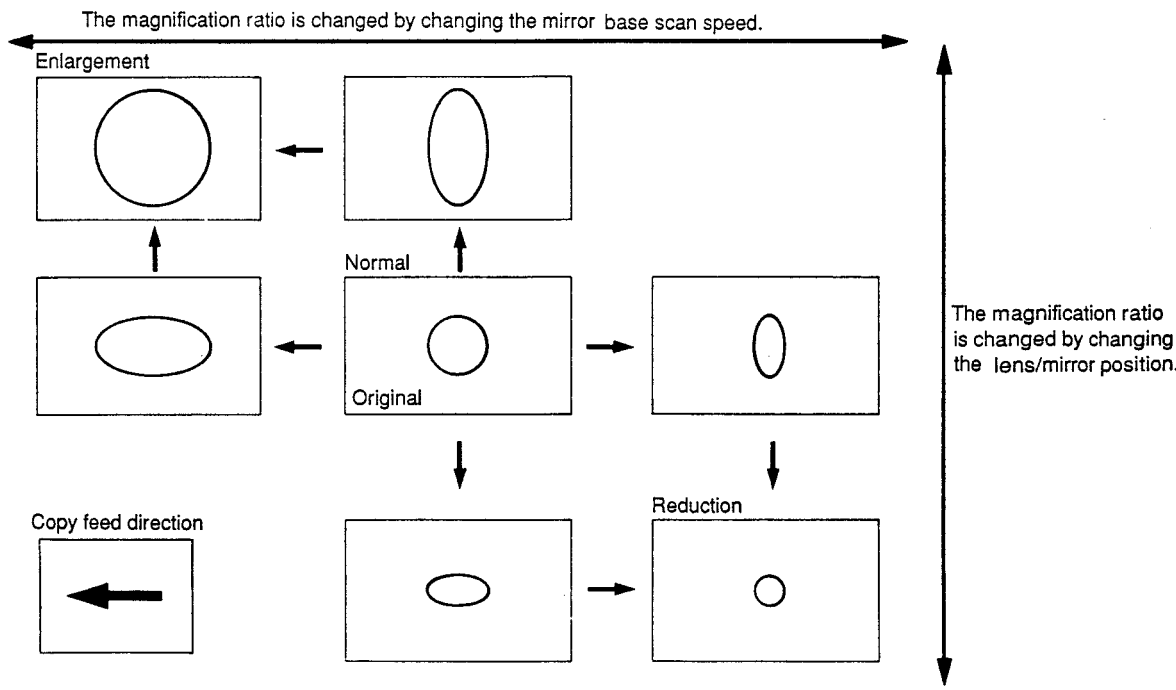


In the normal or 1:1 mode, the table glass to lens distance and the lens to image distance are equal. In this mode the object to image distance is shortest.

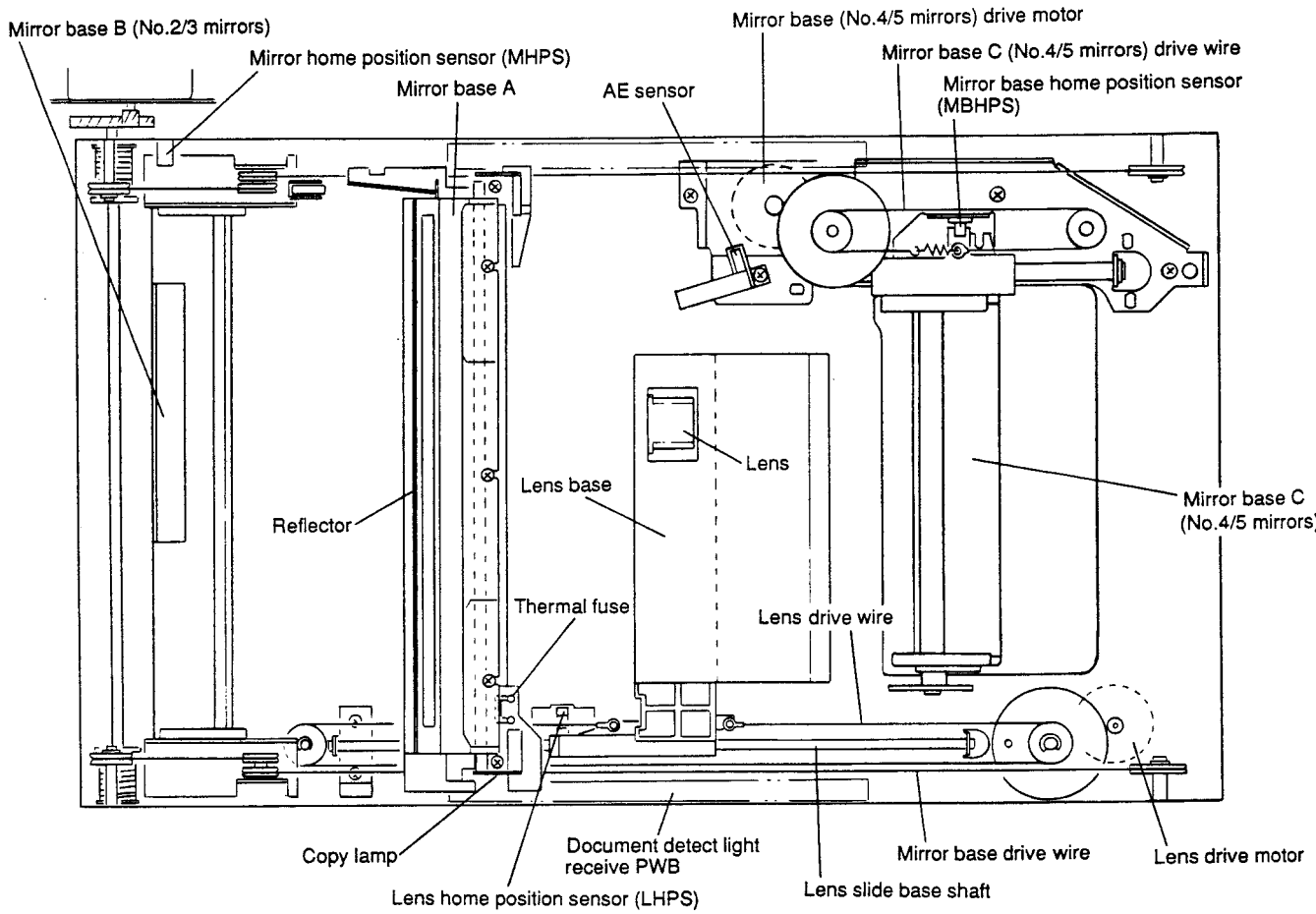


In the reduction mode, as compared to the normal or 1:1 mode, the lens shifts to the image. The document to lens distance becomes longer. The No. 4 and No. 5 mirrors (mirror base C) move away from the lens.
The lens to image distance increases along with the object to image distance.



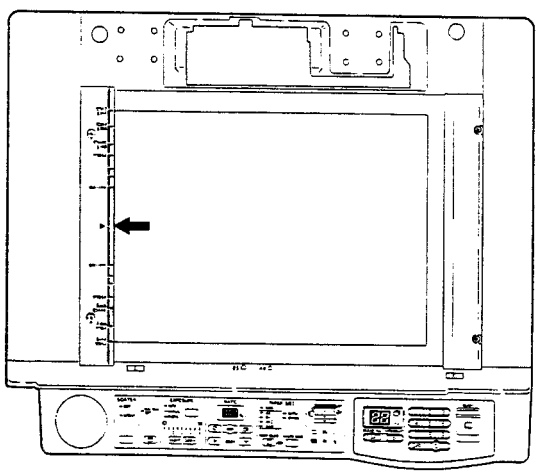

The magnification ratio is changed by changing the mirror base scan speed.
Enlargement
Normal
Original
Reduction
Copy feed direction
The magnification ratio is changed by changing the lens/mirror position.

Names and functions of parts



(1) Document table

The document table is stationary and the document is aligned at the center left of the document glass.



(2) Copy lamp

100V series: 85V, 275W
200V series: 170V, 310W
The copy lamp is controlled by the regulated power supply from the CLC (Copy Lamp Control) PWB to produce stable illumination.

(3) Mirrors

Six mirrors are used.
No. 1 mirror is mounted on the mirror base A.
No. 2 and No. 3 mirrors are mounted on the mirror base B.
No. 4 and No. 5 mirrors are mounted on the mirror base C.
The mirror base A and B move during copy operation in the enlargement and reduction modes.

(4) Lens (fixed focus distance lens)

- Structure: 3 lenses, 1 group
- Aperture: F8.5
- Focal distance: 195mm±1%

(5) Lens home position sensor (LHPS)

Used to sense the lens position. The output signal is used to control magnification ratio based on the home position of the lens. Magnification ratio varies depending on the lens location. A transmission photo sensor is used.

(6) Mirror base home position sensor (MBHPS)

Used to sense the mirror base C (No. 4 5 mirrors) position, The sensor output signal is basic signal to control the copy magnification ratio and focus. A transmission photo sensor is used.

(7) Lens base

The lens is mounted on this base which moves towards the paper entry side in the reduction mode or towards the paper exit side during the enlargement mode using the lens drive motor.

(8) Slide base shaft

Used to control the optical axis of the lens in the enlargement or reduction mode. The lens follows on the slide base shaft.

(9) Lens drive wire
Used to move the lens base.

(10) Mirror base C
No. 4 and No. 5 mirrors are mounted on this base. The position of the mirror base C is shifted by means of the lens drive motor to match the object-to-image distance (OID) in the enlargement or reduction mode.

(11) Mirror base C (No. 4, No. 5 mirrors)drive wire
Used to move the mirror base C (No. 4 and No. 5 mirrors).

(12) Mirror motor
A DC motor is used to scan the mirror bases A and B. The motor speed is varied according to the magnification ratio.

(13) Mirror home position sensor (MHPS)
A photo sensor is used to sense the home position of mirror base A.

(14) Mirror base B
No. 2 and No. 3 mirrors are mounted on this base. It is driven by the mirror motor.

(15) Mirror base A
The mirror base A is composed of the No. 1 mirror, the thermal fuse, the copy lamp, the exposure control plate, and the reflector. It is driven by the mirror motor.

(16) Thermal fuse
The thermal fuse is mounted on the reflector to detect an abnormal temperature rise in the optical system. In case of abnormal temperature rise, the fuse will open to cut the power supply to the copy lamp.
100V series: 109°C
200V series: 109°C

(17) Reflector
Light from the copy lamp is reflected onto the document.

(18) Exposure control plates
Three exposure control plates are installed on mirror base A which can be adjusted to attain uniform light exposure between the front and rear frame side.

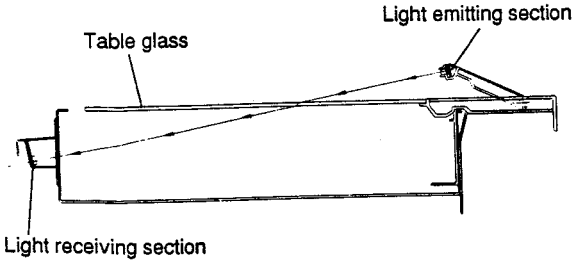
(19) Mirror base drive wire
Used to convey power from the mirror motor to the mirror bases A and B, thus moving the mirror bases.

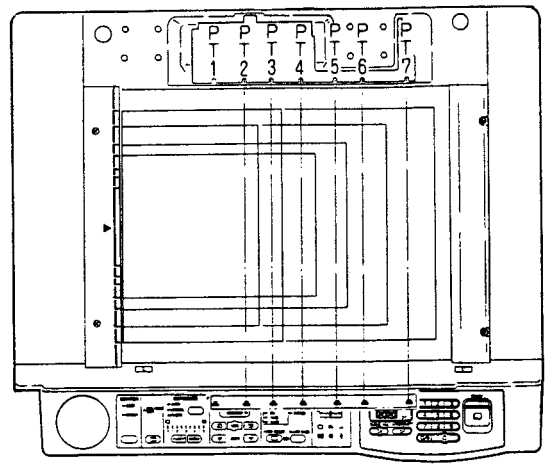
(20) Mirror base (No. 4/5 mirrors) drive wire
A stepping motor is used to shift the mirror base C position.

(21) Lens drive motor
A stepping motor is used to shift the lens position.

(22) AE sensor
Density of the original is sensed by the light from the copy lamp. The AE sensor area is 100mm (4") at the center. A photodiode is used for the sensor element.

(23) Document size detection
The document size detection system in this machine is the document interruption system of direct light reception. This system is less affected by external lights than the reflection system.
The LED in the rear frame side emits light to the table glass, and document size is detected when the document interrupts this light.





(24) Dustproof glass
To prevent dust from entering into the optical system, the glass is installed on the lower dark box cover.

2. Paper feed section

Outline of the paper feed section

(1) The SF-7855/7830 allows the single manual paper feed in addition to the 250-sheet cassette (semi-universal).

(2) Manual paper feed
Manual paper feed allowable range: 45 ~ 110kg (52g/m^2 ~ 128g/m^2) A3 ~ A6 For paper of 91 ~ 110 kg (105g/m^2 ~ 128g/m^2), the paper size should be max.

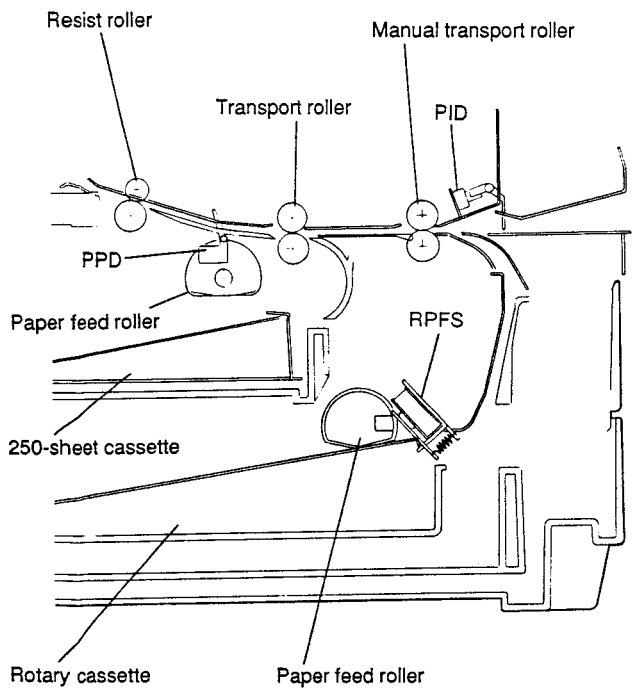
* • Special paper copy allowable range
  • Second original paper: 45 ~ 60kg (52 ~ 70g/m^2)
  • OHP film: 60 ~ 110kg (70 ~ 128g/m^2)
  • Offset master: A4/LT, about 90kg (105g/m^2)
  • Label paper, postcard: 60 ~ 110kg (70 ~ 128g/m^2)
  • Postcard (max. 25 sheets)

(3) Cassette paper feed
① 250-sheet semi-universal cassette (Size can be changed by the user.)
Paper size: A3, B4, A4, A4R (AB series)
11" x 17", 8½" x 14", 8½" x 11, 8½" x 11"R (inch series)

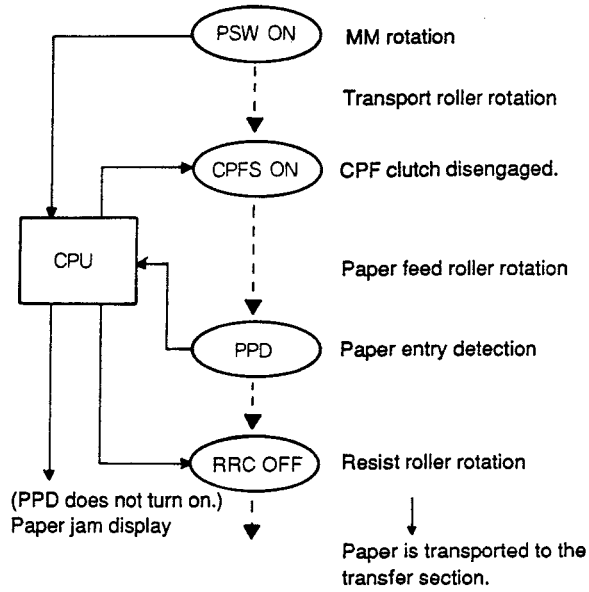
② Lower 250-sheet cassette (Service selection is made by a serviceman.)
Paper size: A4 (AB series), 8½" x 11" (Inch series)

* Cassette paper feed allowable range
48 ~ 68kg (56g/m^2 ~ 80g/m^2) Standard type, economy type, Color paper

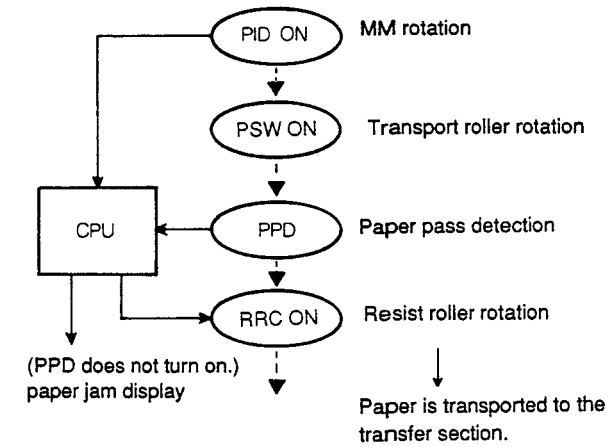
Paper feed section cross sectional view



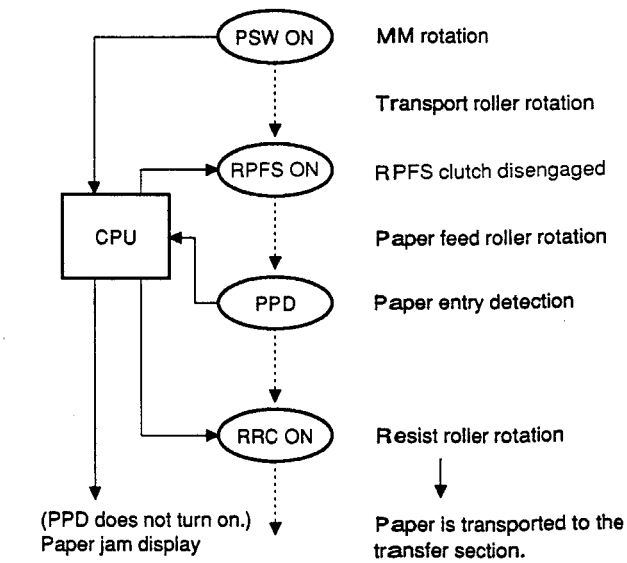
Cassette paper feed operation



Manual paper feed operation



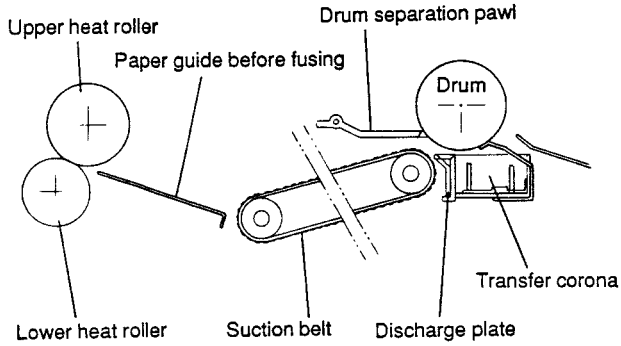
Lower cassette operation



3. Transfer/transport section

- This machine uses a small-diameter drum (30mm in diameter).
- After passing through the resist roller, the paper is transported to the transfer section, where images on the drum are transferred onto the transfer paper by the transfer corona.
- After transfer, the transfer paper is discharged by the discharge plate and separated from the drum. The transfer paper which was not separated is forcibly separated by the drum separation pawl.

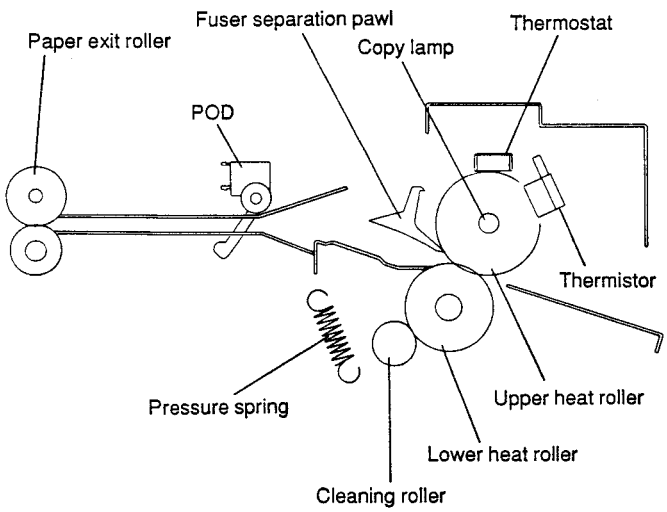
Transfer/transport section cross sectional view



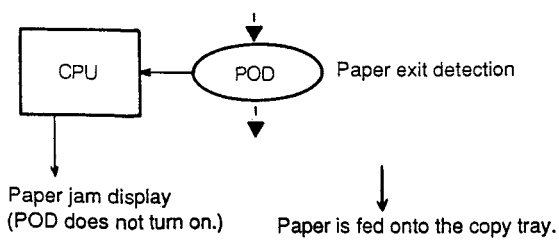
4. Fusing/paper exit section

Toner image transferred on the paper is fused on the paper by the heat and pressure of the upper and lower heat rollers. After fusing, static electricity is discharged by the discharge brush and the paper is fed onto the copy tray.

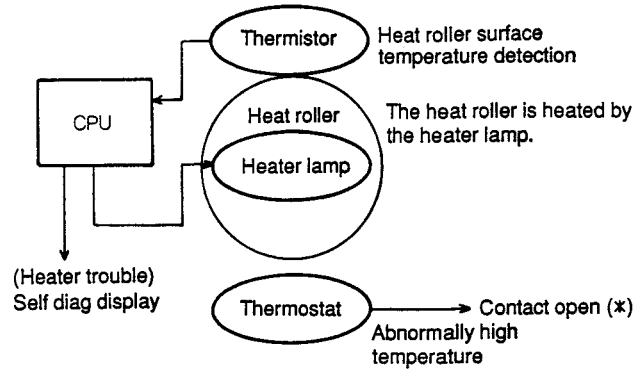
Fusing/paper exit section cross sectional view



Operation



Temperature control

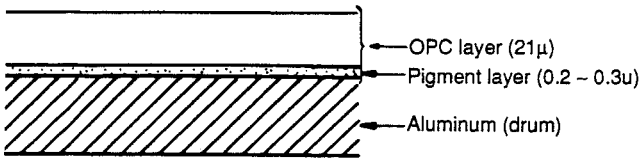


- Abnormally high temperature (H3): 230°C
- Abnormally low temperature (H4): Set temperature –40°C
- Thermistor breakage (H2)

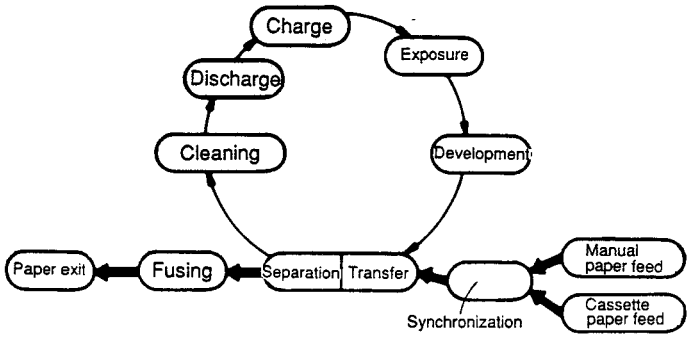
(*) When the thermostat contact is opened, press the reset button in the upper side of the thermostat to reset. (The contact does not reset automatically.)

5. Image forming section

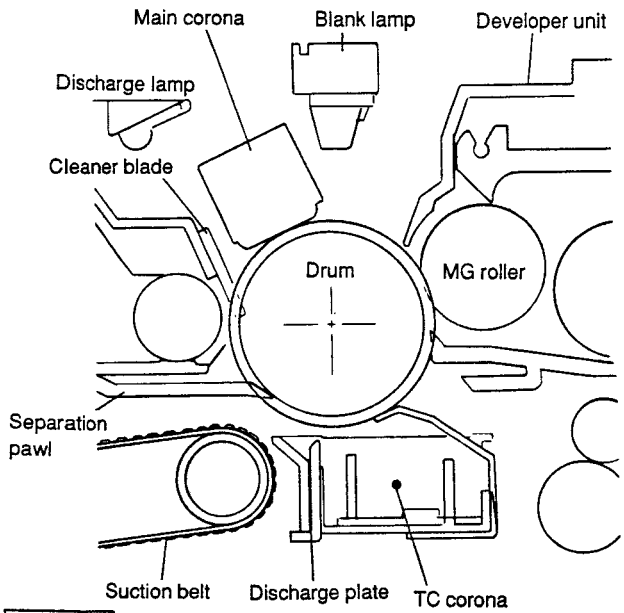
- This machine uses O.P.C. (Organic Photo Conductor) for image forming.



Functional diagram



Cross sectional view



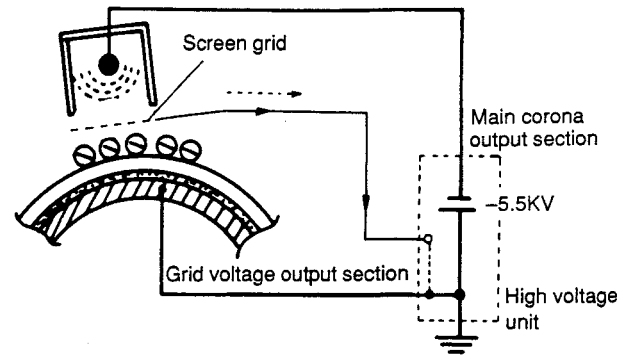
Process

Step 1. Charge DC–5.5KV 700uA Grid voltage –635V

A uniform negative charge is applied over the OPC drum surface by a negative charge from the main corona unit. The surface potential of the OPC drum is controlled by the screen grid and a potential equal to the grid voltage is retained.

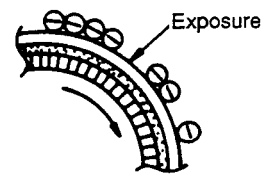
- Drum surface potential < Grid voltage
  The negative discharge passes through the screen grid to charge the drum.
- Drum potential ≧ Grid voltage
  Since the negative charge passes to ground through the screen grid via the grid voltage output line of the high voltage transformer, the drum surface potential is kept at almost the same level as the grid voltage.

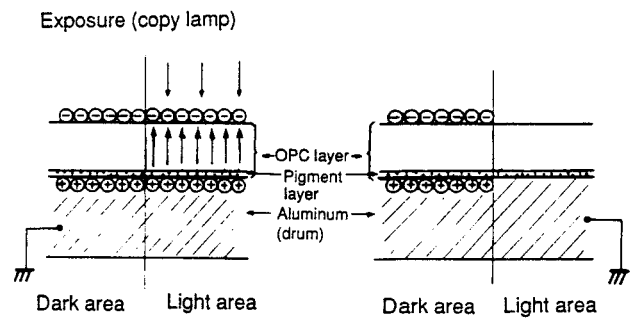
Standard copy mode: –635V
Photo mode: –510V for U.S.A, Canada, and U.K.
–535V for the other destinations.



Step 2. Exposure (Copy lamp, mirror, lens)

Light from the copy lamp is reflected from the document and projected onto the drum surface via the mirrors and lens. The resistance of the OPC layer decreases in the area exposed to the light which corresponds to the light area of the document. This reduces the negative charge in direct proportion to the intensity of the light. The dark area of the document does not reflect light and an electrostatic latent image is formed on the drum surface.

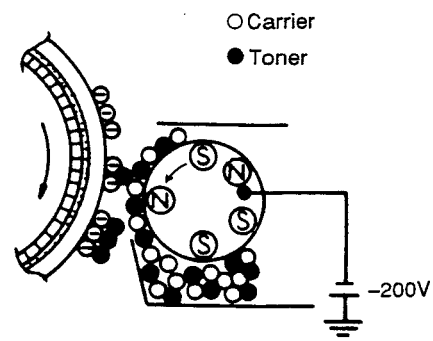




In the reduction mode, the area outside the document image area is neutralized by the blank lamp prior to exposing.

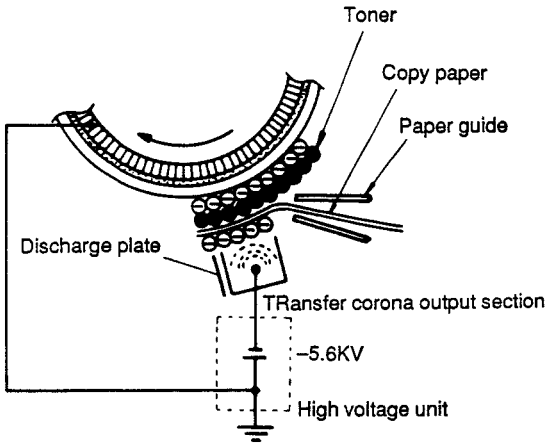
Step 3. Developing (Bias –200V)

The electrostatic latent image is converted into a visible image by the toner. A bias potential of -200V is applied to the carrier (MG roller) in the two component magnetic brush developing method, and the toner is charged positive through friction with the carrier.



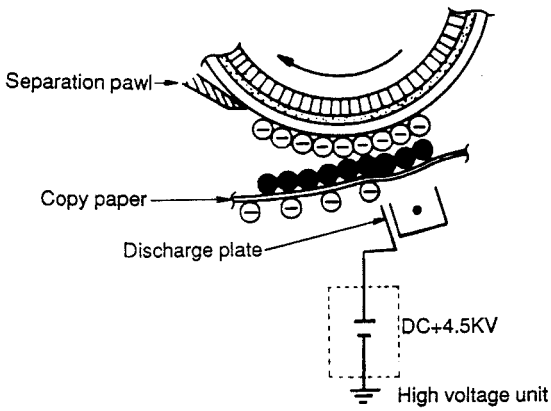
Step 4. Transfer (DC–5.6KV, –35μA)

The visible image on the drum surface is transferred onto the copy paper by applying a negative charge from the transfer corona to the back of the copy paper.



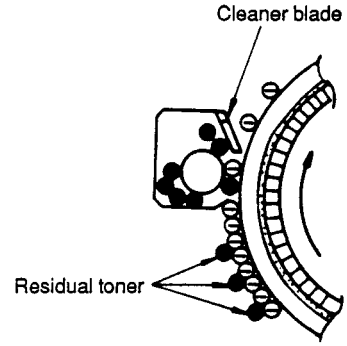
Step 5. Separation (DC+4.5KV without load)

Both the copy paper and the drum are charged negative after the transfer of the image. However, an attracting force remains between the copy paper and the drum because the negative potential of the copy paper is higher than the negative potential of the drum. A positive potential is applied by the discharge plate to reduce the copy paper potential to the same level as the drum surface. This eliminates the attracting force and allows the copy paper to separate from the drum by the rigidity of the paper itself. If the copy paper is not separated, it is forcibly separated by the separation pawl.



Step 6. Cleaning

A cleaning blade is used to remove residual toner from the drum surface.



Step 7. Discharge

Light from the discharge lamp exposes the drum surface and reduces the electrical resistance in the OPC layer. This removes the residual surface charge.

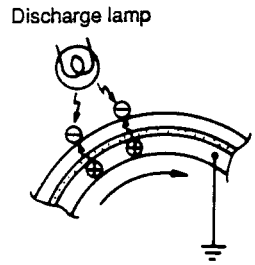
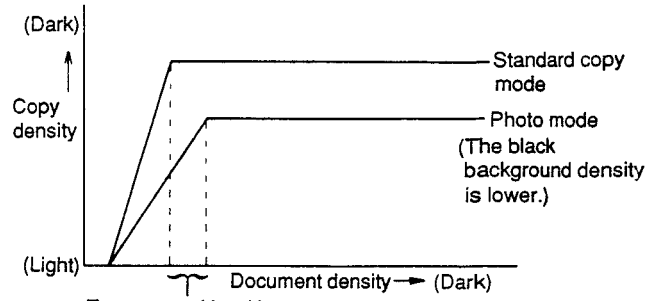


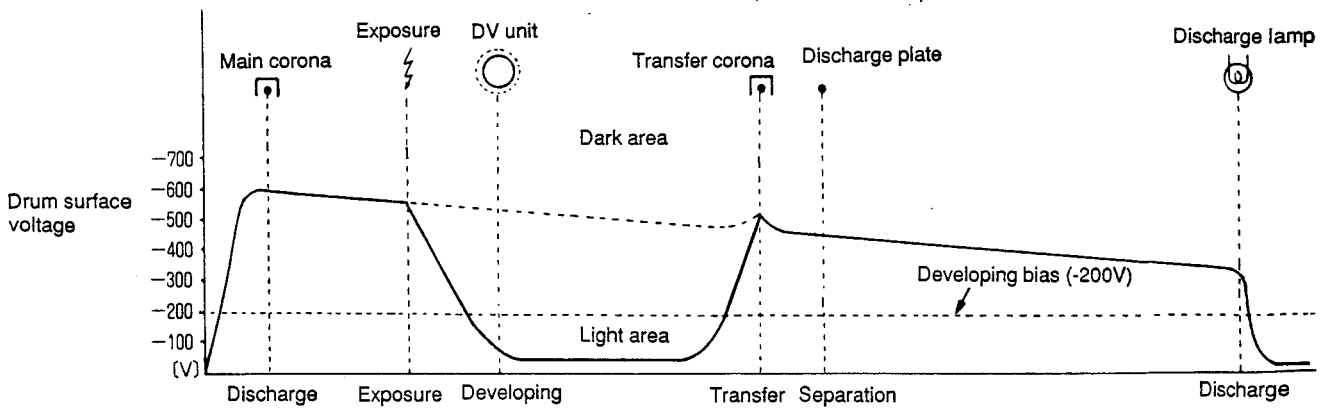
Photo mode

The SF-7855/7830 provides the photo mode to copy half tone documents clearly.

The gradations of the half tone documents are made clearer by reducing the main corona grid voltage and the copy lamp drive voltage to a lower level then in the normal copy mode.



Toner control level increases to provide a wider expression of half tone.



[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENTS

<<Note for disassembly, assembly, and adjustment>>

(1) Before disassembling, disconnect the power plug from the power outlet.

(2) Never disassemble or assemble the PWB's and the connectors with the power ON.

(3) Be careful not to drop small parts or screws inside the machine. Use extreme care when disassembling and assembling.

(4) Do not pull the wire section of the connector, or it may be damaged. Hold the both sides of the connector and pull to disconnect.

(5) When carrying the control PWB, put it in a static electricity preventing bag.

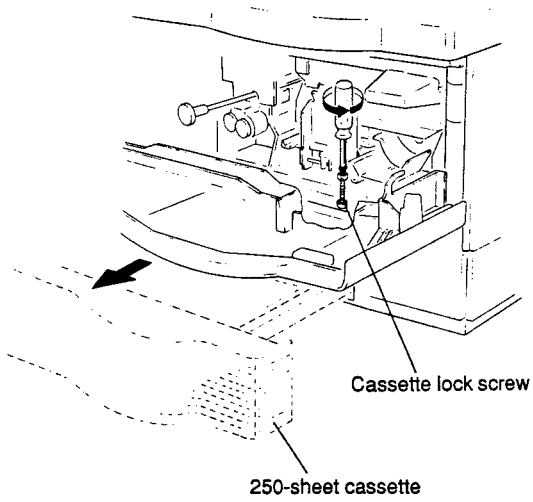
(6) Keep the document glass and mirrors clean.
Wipe them with a dry cloth if necessary.

(7) Do not touch the lamp and glass surfaces.
(Oil on the surface concentrates heat and generates color change.)

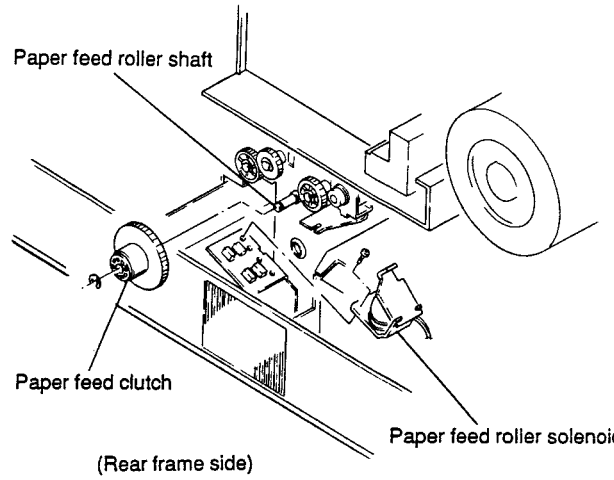
1. Paper feed section

A. Removing the paper feed roller and the roller rubber

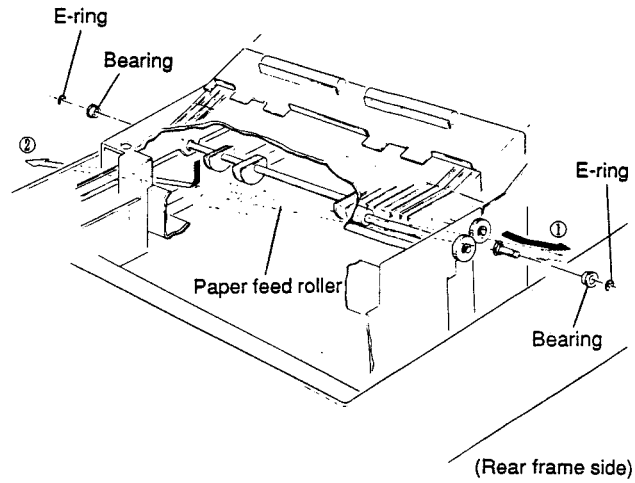
① Loosen the cassette lock screw, and remove the cassette.



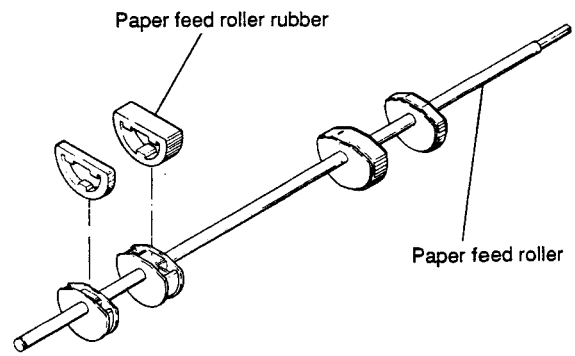
② Remove the paper feed roller solenoid and remove the paper feed clutch.



③ Remove the E-rings (in the rear frame side and the front frame side) which are fixing the roller shaft, slide the roller to the rear frame side, then slide it the front frame side to remove.



④ The roller rubber can be replaced in single unit.



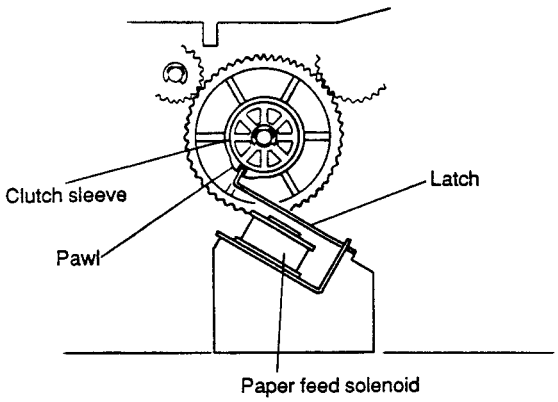
⑤ For assembly, reverse the removing procedure. After assembly, check the roller angle.

Paper feed roller angle adjustment

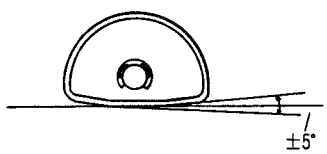
After installing the paper feed roller, adjust the roller angle. If the angle is shifted from the reference value, adjust it by changing the paper feed clutch spring hooking position.
(Perform the same adjustment for the rotary cassette paper feed roller.)

<Checking procedure>

① Engage the latch of the paper feed solenoid with the paper feed clutch sleeve pawl.



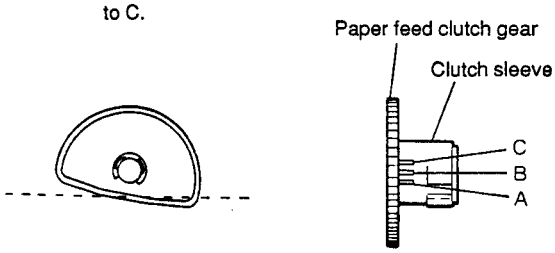
② Visually inspect from the insertion port of the cassette to check that the paper feed roller is horizontal (horizontality ± 5 degrees). If the roller is tilted, adjust as follows:



<Adjustment procedure>

- Change the hooking position of the clutch spring according to the tilting direction of the roller.

Example 1: The clutch sleeve hooking position is changed from B to C.

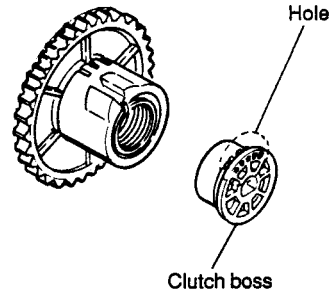


(Viewed from the front side)

Example 2: The clutch sleeve hooking position is changed from B to A.

(Viewed from the front side)

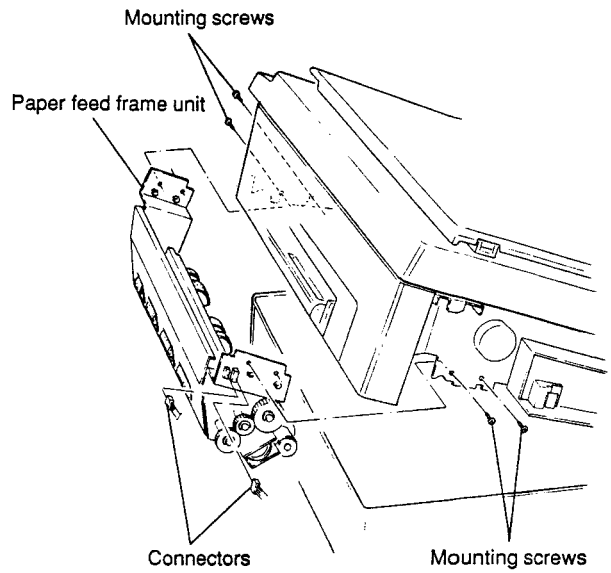
- If adjustment is not sufficient in the clutch sleeve side, change the hooking position in the clutch boss side.



B. Paper feed frame unit removal

① Open the clamshell, and remove connectors (2 pin, 3 pin).

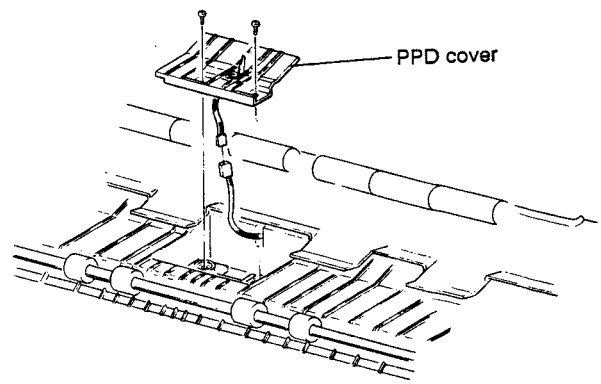
② Remove the screws (two in the front frame side and 2 in the rear frame side) which are fixing the paper feed frame unit.



C. paper pass detector (PPD) replacement

(Removal)

① Remove the two screws which are fixing the PPD cover, and remove the PPD cover.



② Remove the PPD from the PPD cover, and remove the connectors.

(Assembly)

① Attach the PPD cover and insert the connector.

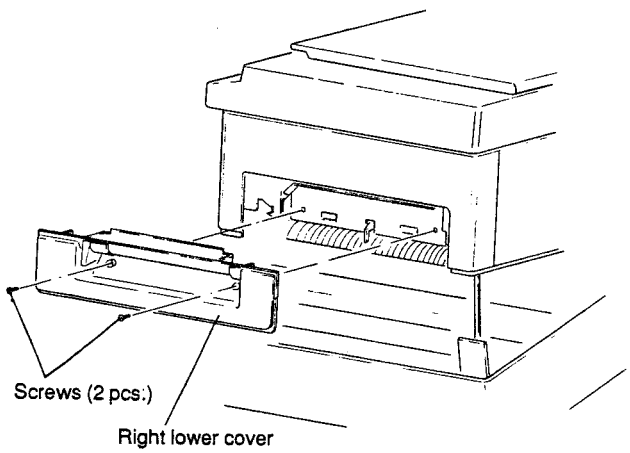
② When attaching the PPD cover, ensure the lead wires are not caught between the cover and the base plate.

③ Since the fixing screws are tap screws, do not tighten them excessively.

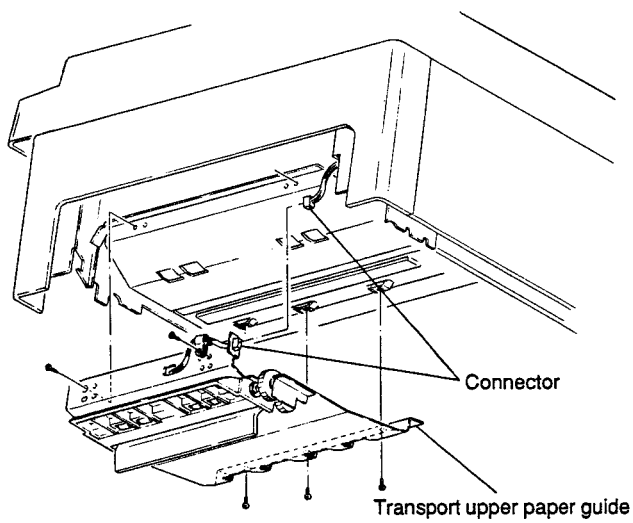
D. Removing the transport upper paper guide and the manual paper entry detector (PID)

<Removing the transport upper paper guide>

① Remove the right lower cover.

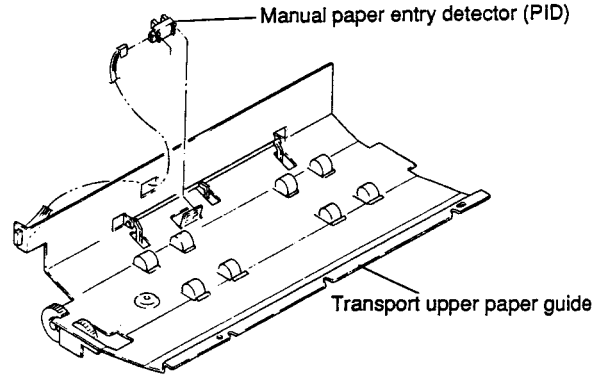


② Remove the 3-pin connector and five screws which are fixing the transport upper paper guide, and remove the paper guide.



(Removing the manual paper entry detector)

Remove the connector of the manual paper entry detector, and remove the detector.

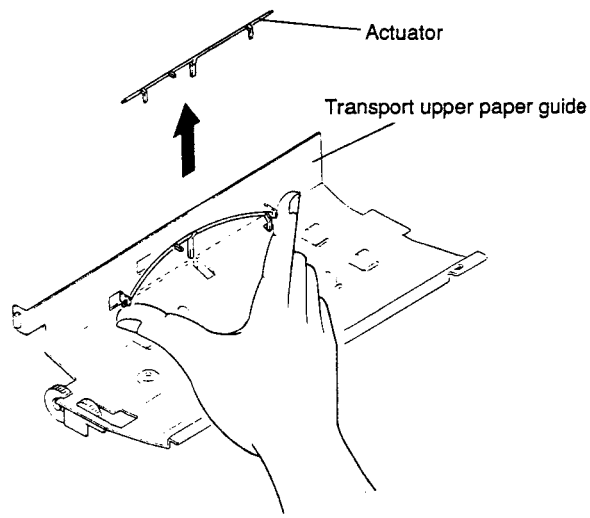


* When attaching the detector, check that the detector hook section is firmly connected. Be careful to prevent the interface harness from being in contact with the actuator.

<Removing the actuator>

Deflect the actuator as shown below and remove it from the holder.

* After attaching the actuator, check that it moves smoothly.



2. High voltage section

The TC case should be cleaned every 30,000 copies. The TC wire and the discharge plate should be cleaned every 30,000 copies, and should be replaced every 60,000 copies.

A. TC case unit disassembly/assembly

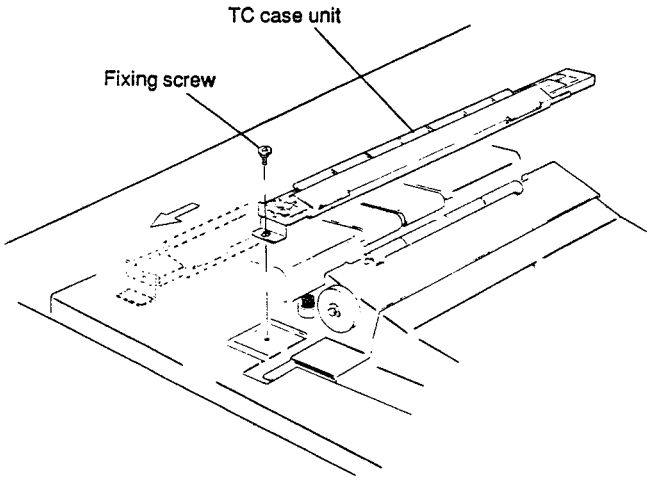
<Disassembly>

① Open the clamshell.

② Remove the step screw which is fixing the TC case unit.

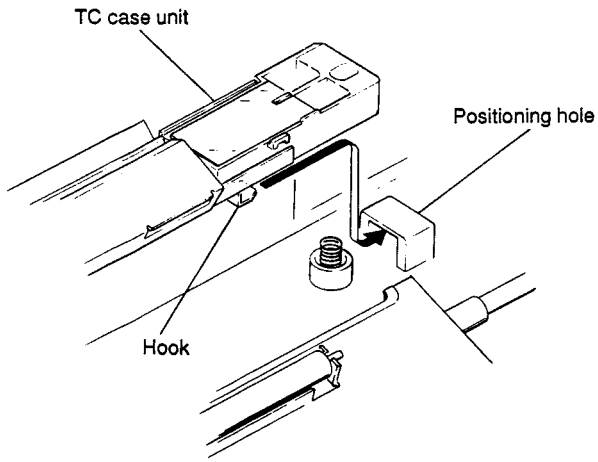
③ Remove the TC case unit.

* When removing the TC case unit, be careful not to hit the drum.



<Assembly>

① Set the TC unit case hook to the positioning hole in the base plate rear frame side.



② Tighten the step screw. (Be careful not to catch the TC case with the step screw.)

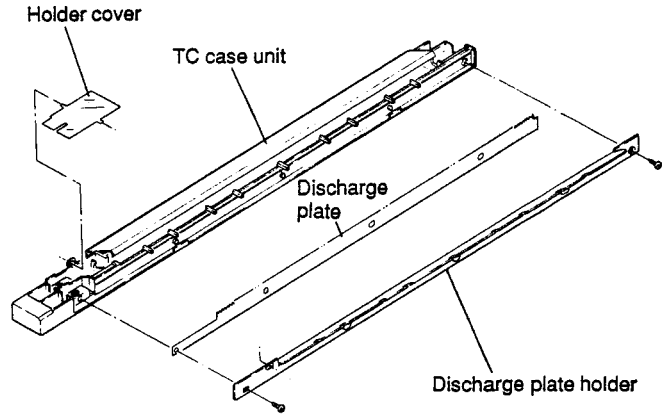
B. Discharge plate replacement/cleaning (Every 60K copies)

① Remove the TC case unit from the body.

② Remove the holder cover.

③ Remove the discharge plate holder. (2 screws)

④ When assembling the discharge plate, use the positioning pin.
Note: Discharge plate is easy to deform. Use care.



C. TC wire replacement/cleaning (Every 60K copies)

① Remove the TC case from the body.

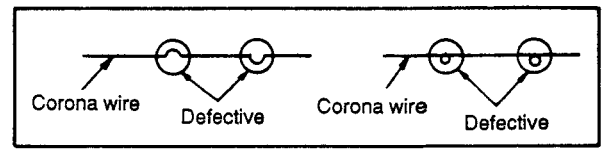
② Remove the holder cover.

③ Loosen the wire fixing screw, and remove the wire.

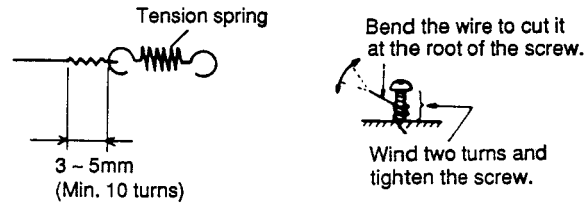
④ Install the corona wire.

<Note for corona wire replacement>

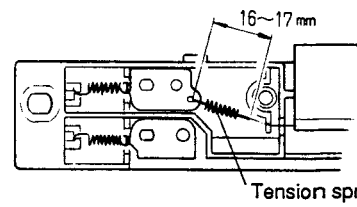
- The corona wire should be free from twist and deformation.



- Use corona wire of 70μ. (DWIR-0466CSZZ)



- The tension spring should be 16 ~ 17mm long when the wire is stretched.

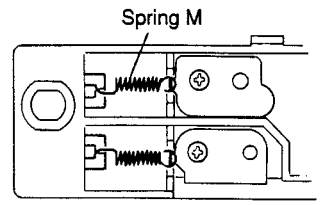


- Do not touch the working area of the wire. It may cause defective transfer.

⑤ After replacing the wire, clean the wire.
Note: When cleaning the wire, wipe it from the screw to the spring.

D. Note for spring M assembly

Attach the spring M as shown below:



3. Optical section

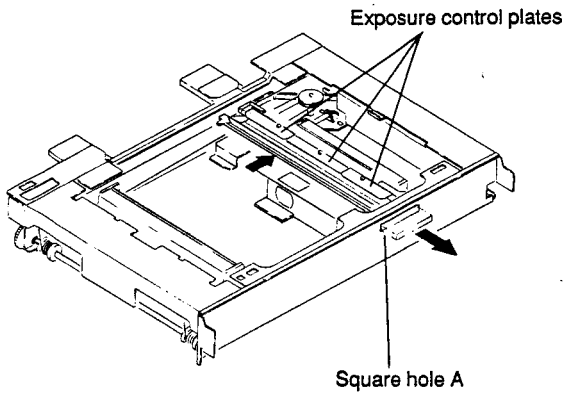
(1) Disassembly/assembly

A. Replacing the copy lamp

① Remove the table glass holders (left, right) and the table glass.

② Move the copy lamp unit to square hole A.
When moving the copy lamp unit, do not pull forcibly. Pulling the copy lamp forcibly may disengage the wire fixing section. Do not move the exposure control plates.

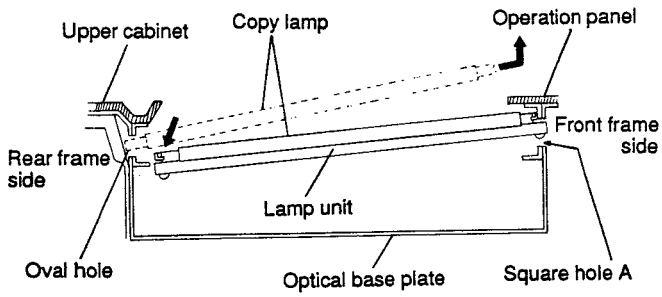
③ Insert the copy lamp unit into the square hole and shift it fully in the direction of arrow.



④ Disengage the rear end of the lamp unit from the rail and hold the unit as shown.

⑤ Remove the fixing screw of the lamp electrode in the rear side and remove the electrode.

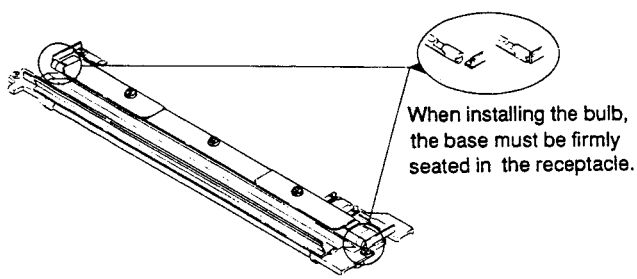
⑥ Insert the rear side of the lamp into the oval hole in the frame and pull it out from the front side.
Note: When holding the lamp, do not hold the glass surface but hold the both insulators. If the glass surface is dirtied with oil, the lamp life may be shortened.



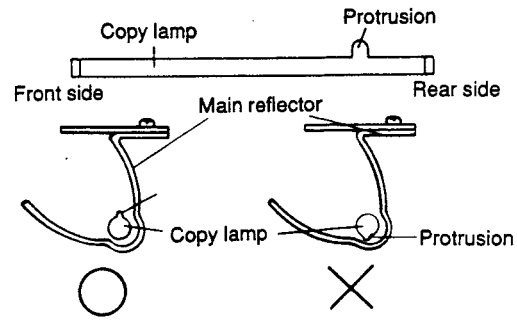
<Installing procedure>

For installing the copy lamp, reverse the disassembly procedure with observing the following notes.

① Be sure to put the copy lamp in the lamp groove properly.



② Be careful to the installing direction of the copy lamp.
Install the bulb so that the projection on the bulb is towards the rear frame side and facing upwards as shown in the figure below:



③ Check that the mirror base is on the rail.

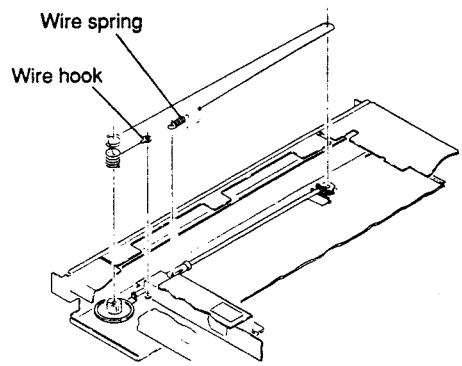
B. Replacing the lens drive wire

(Removing the lens drive wire)

① Remove the table glass.

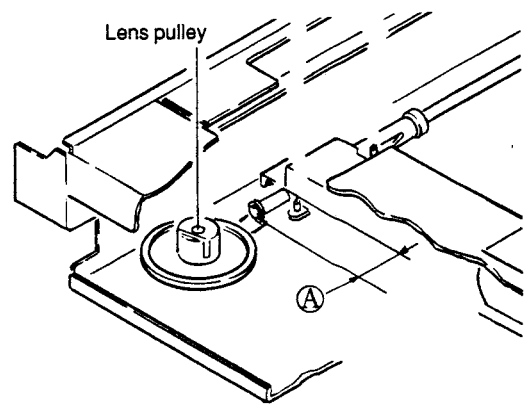
② Remove the dark box cover and the lens cover.

③ Remove the wire spring and the wire hook from the lens base boss.

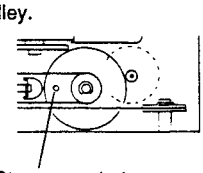


(Setting the lens drive wire)

① Align the lens slide base unit to the 50% position. The length of section A is about 10mm.

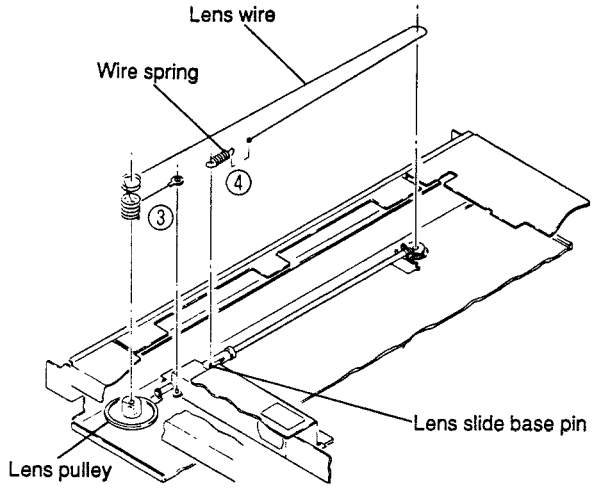


② Insert an M4 x 10 screw in the screw stop hole of the lens pulley gear and hold the pulley.



③ Insert the ball at the center of the lens drive wire in the slit of the lens pulley gear. Turn the wire end with shorter distance from the ball five turns counterclockwise from the lower to the upper side and hook it to the lens slide base pin via the pulley.

④ Wind the other end of the wire 2¼ turns clockwise from the upper to the lower sides and hook it to the wire spring via the pulley, then insert it in the lens slide base pin.



⑤ Remove the lens pulley gear stop screw.

⑥ Manually rotate the lens pulley gear. Move the lens slide base to the enlarge and reduce sides to check that it has no wire disconnection and it works smoothly without wire overlap.

C. Replacing the lens

(Removing the lens)

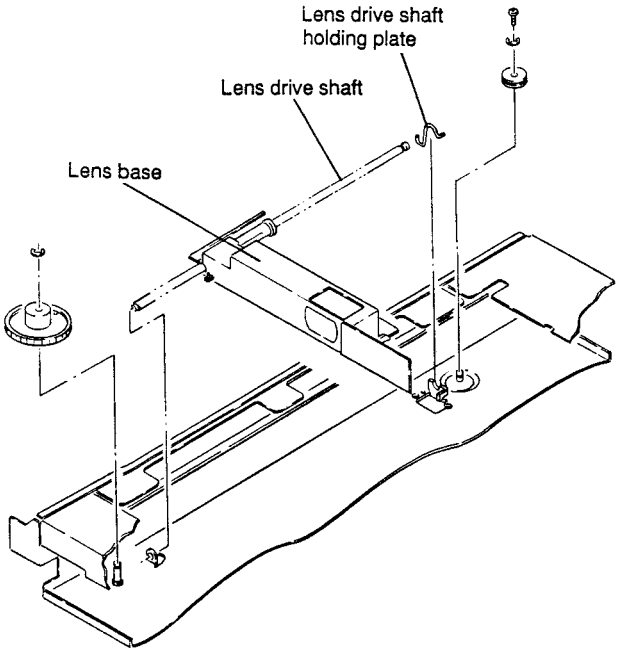
① Remove the table glass.

② Remove the dark box cover.

③ Remove the lens drive wire.

④ Remove the lens drive shaft holding plate and the lens drive shaft. In this state, the lens base may come out.

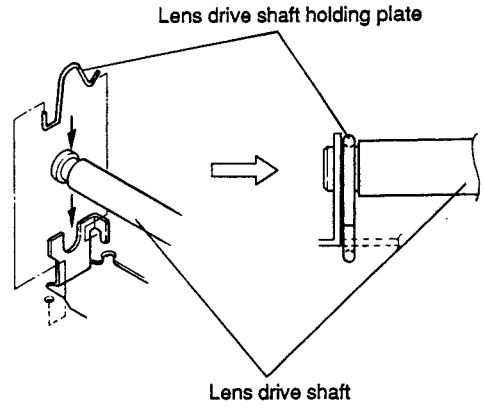
* Do not loosen the setscrew which is beside the lens drive shaft, This screw is used as a guide when installing the lens drive shaft holding plate.



(Installing the lens)

Do the reverse sequence.

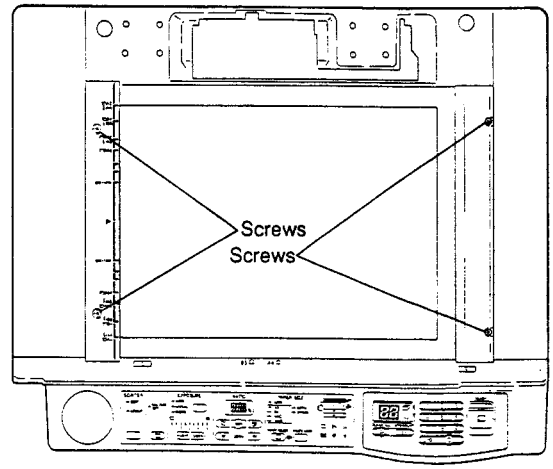
Note: When installing the lens drive shaft holding plate, move it to the front frame side so that the holding plate may hit the setscrew.



D. Replacing/adjusting No. 2 and No. 3 mirror drive wire

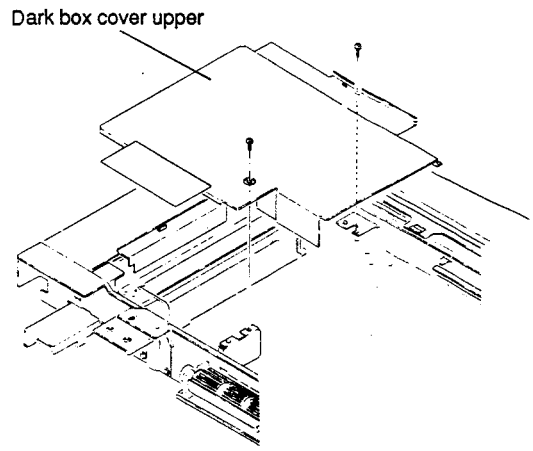
(Removing the copy lamp)

① Remove the glass holder and remove the table glass. (4 screws)

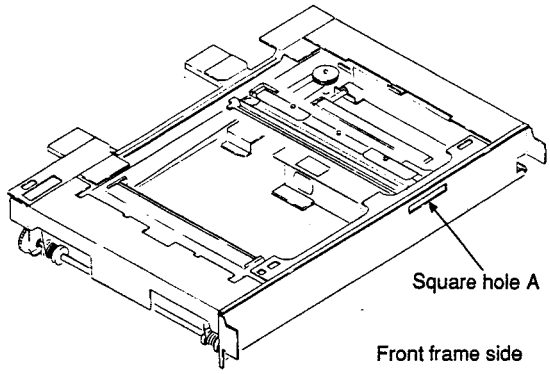


② Remove the operation panel, the upper cabinet rear, the right cabinet C.

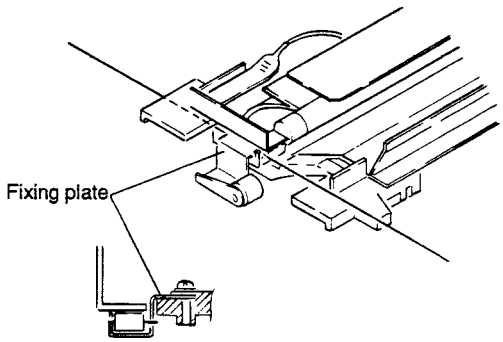
③ Remove the dark box upper cover.

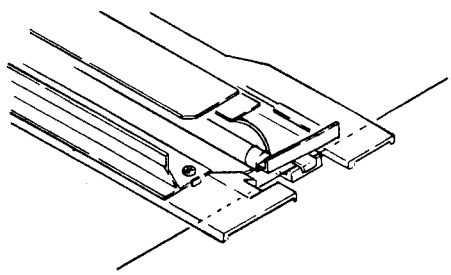


④ Manually move the mirror base (No. 2/3 mirror unit) to shift the copy lamp unit to square hole A.

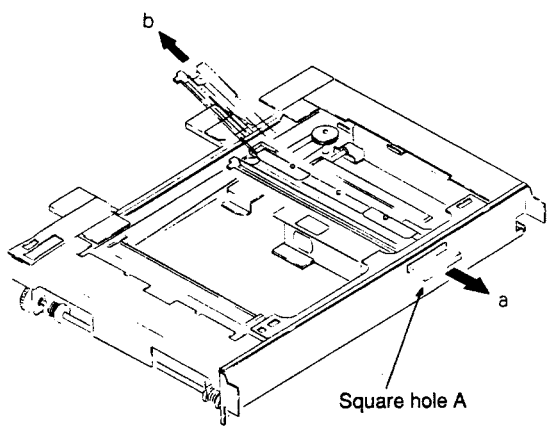


⑤ Remove the wire fixing plate in the front and rear frame sides of the copy lamp unit.



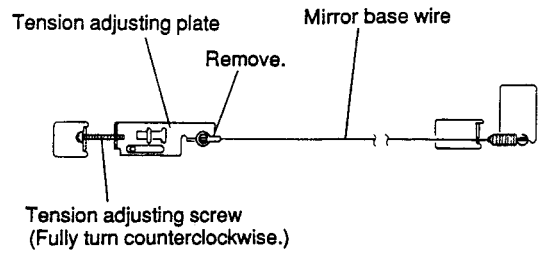


⑥ Insert an end of the lamp unit into square hole A (in the direction of a) and pull it out in the direction of b.



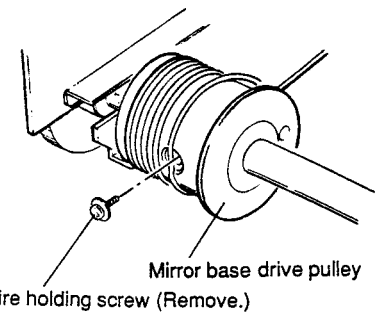
(Removing the No. 2/3 mirror drive wire)

① Fully turn the mirror base wire tension adjusting screw in the front frame side counterclockwise to loosen the mirror base wire tension.



② Remove the mirror base wire end in the front frame side from the tension adjusting plate.

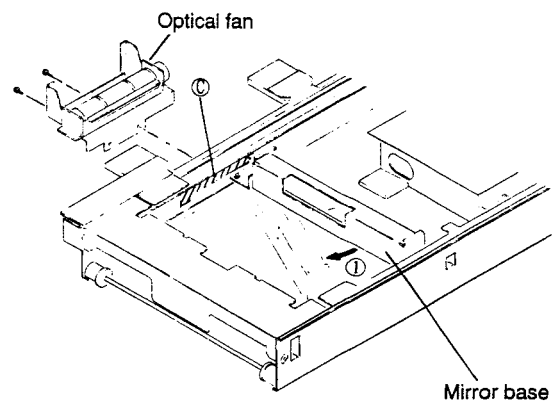
③ Remove the mirror base wire from the mirror base drive pulley. (Remove the wire holding screw.)



(Perform the same procedure for the rear frame side.)

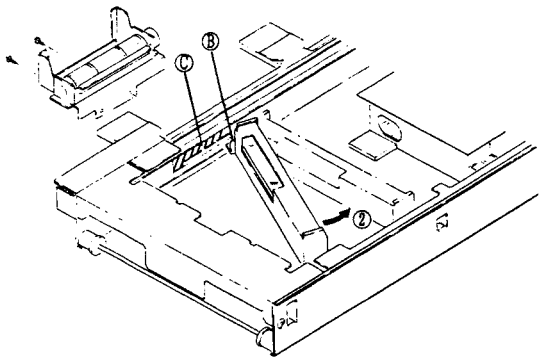
(Removing the No. 2/3 mirror unit (mirror base B))

Remove the optical fan in the rear frame, move the mirror base B to square hole © in the rear frame, and rotate it in direction ① to pull out.



(Installing the No. 2/3 mirror unit (mirror base B))

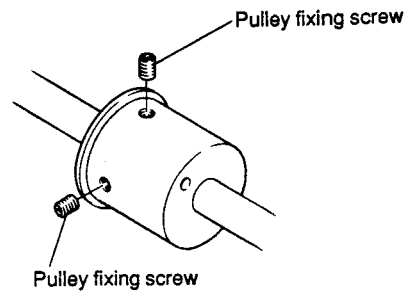
Reverse the removing procedure. Insert section Ⓑ of the mirror base B into square hole Ⓒ in the rear frame and turn it in direction ② to put it in. In this case, the optical fan is not installed in the rear side.

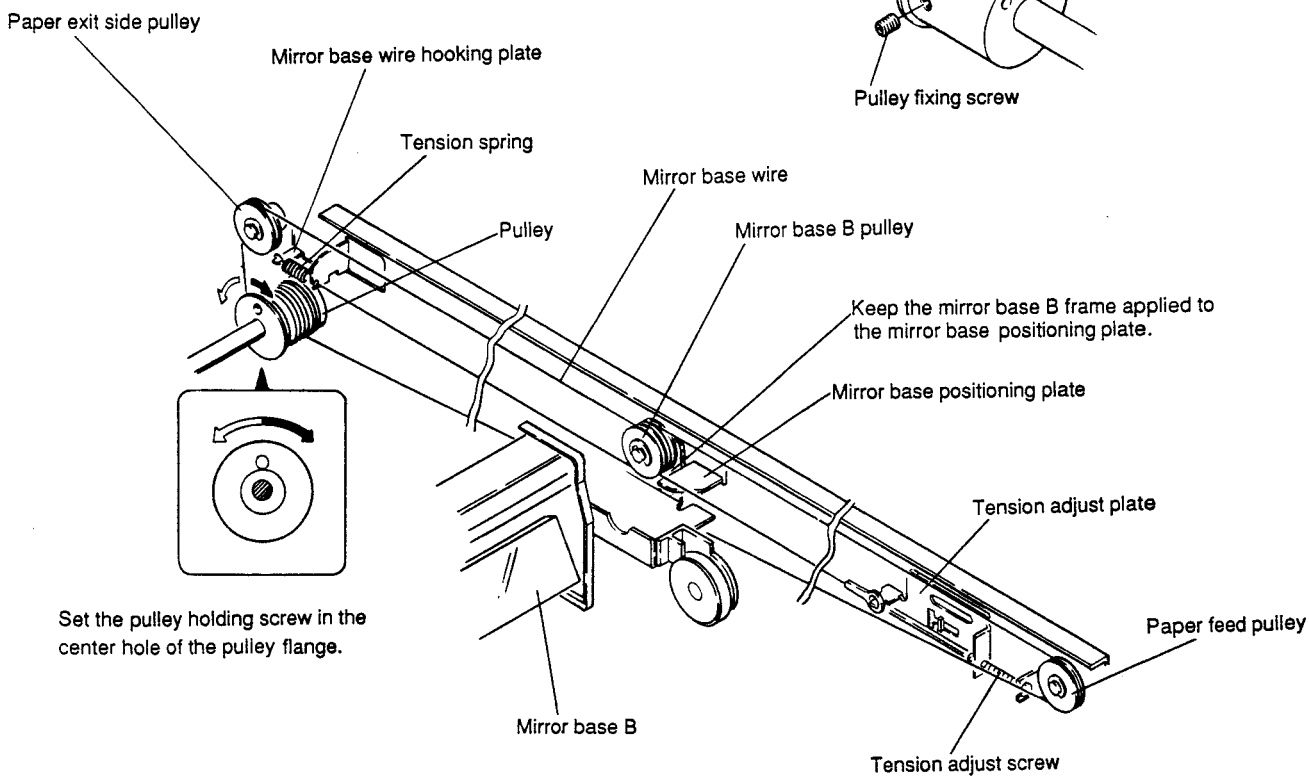


(Setting the No. 2/3 mirror drive wire)

Check that the wire grooves of the two mirror base drive pulleys (winding pulleys) in the front and the rear sides are at corresponding positions on the circumference. Then perform the following procedure. (If the wire grooves are not at corresponding positions, loosen the pulley fixing screws (two setscrews) and visually inspect and adjust the positions.)

① Hang the mirror base wire end (metal hook) on the tension adjusting plate hook.




Paper exit side pulley
Mirror base wire hooking plate
Tension spring
Mirror base wire
Pulley
Mirror base B pulley
Keep the mirror base B frame applied to the mirror base positioning plate.
Mirror base positioning plate
Tension adjust plate
Paper feed pulley
Set the pulley holding screw in the center hole of the pulley flange.
Mirror base B
Tension adjust screw

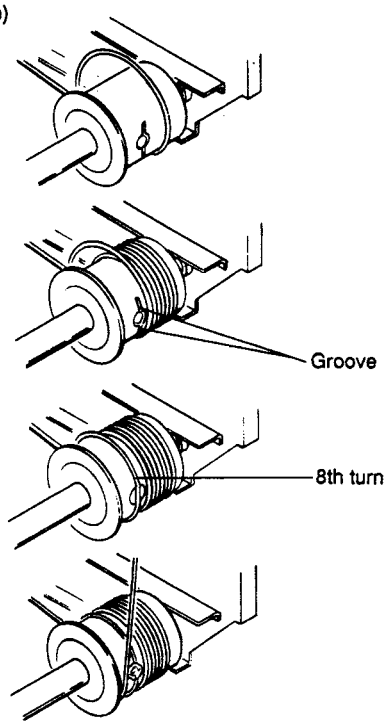
② Pass it through the mirror base B pulley (outside). In this case, the mirror base B is in contact with the mirror base positioning plate.

③ Pass it through the paper feed side pulley.

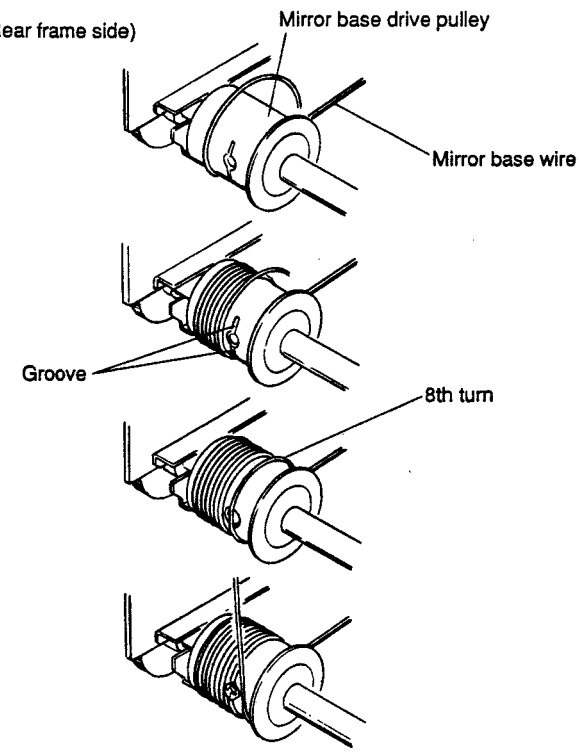
④ Pass it under the mirror base B.

⑤ Hold so that the wire groove section of the mirror base drive pulley is in the upper side, and wind the wire 9 turns with the 8th turn in the groove. (The first turn is 9 ~ 10mm from the groove. Winding should be tight and close.)

(Front frame side)



(Rear frame side)



⑥ Pass it through the paper exit side pulley.

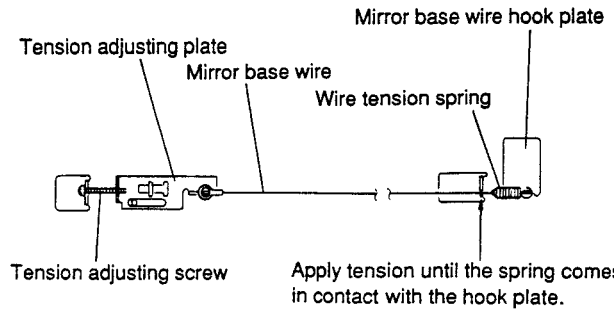
⑦ Pass it through the mirror base B pulley (inside).

⑧ Hang the mirror base wire end (spring) on the mirror base wire hook notch. (Perform the same procedure in the front and the rear sides.)

(Adjusting mirror base wire tension)

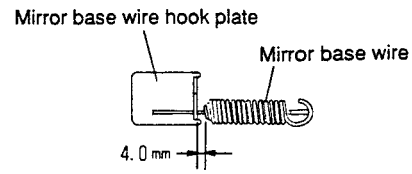
① Manually rotate the mirror base drive pulley to move mirror base B in contact with the mirror base positioning plate 20 to 30mm towards the paper exit side.

② Rotate the mirror base wire tension adjusting screw clockwise until the wire tension spring end just hits the mirror base wire hook plate.


Mirror base wire hook plate
Tension adjusting plate
Mirror base wire
Wire tension spring
Tension adjusting screw
Apply tension until the spring comes in contact with the hook plate.

③ Manually rotate the mirror base pulley to make a full scan of mirror base B for a few times to ensure that the mirror base wire spring end is in contact with the mirror base wire hook plate. If not in contact, readjust the tension adjust screw. Also, check that the wire does not overlap each other on the mirror base pulley.

④ Rotate the mirror base wire tension adjust screw counterclockwise six times. (The distance between the mirror base wire spring and the mirror base wire hook plate becomes about 4mm.)



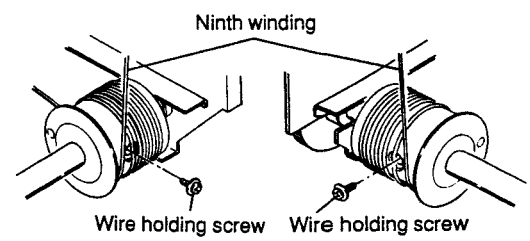
(Do the same for the front and rear frame sides.)

(Securing the mirror base wire)

① Manually rotate the mirror base drive pulley to move mirror base B to the location where it hits the mirror base positioning plate.

② Shift the ninth winding of the mirror base wire from the pulley screw hole.

(Front frame side) (Rear frame side)



③ Fasten the mirror base wire to the pulley using the mirror base wire holding screw. Only the 8th winding should be secured with the screw.

④ Return the ninth winding of the mirror base wire to its original position. (do the same for the front and the rear frame sides.)

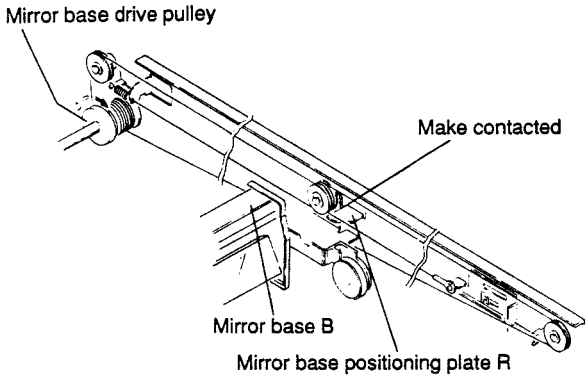
E. Installing the No. 2/3 mirror unit (mirror base B)

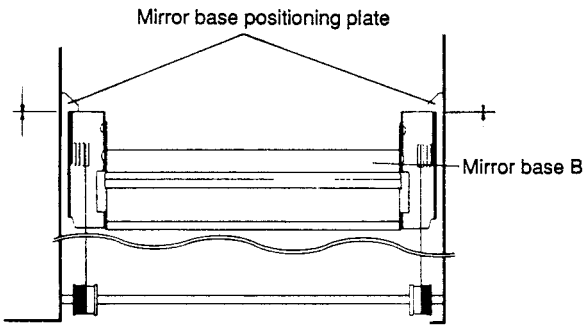
(Positioning mirror base B)

The adjustment is required to adjust the collateral position of mirror base B relative to the drum surface and the document surface.
Adjustment is required in one of the following cases:

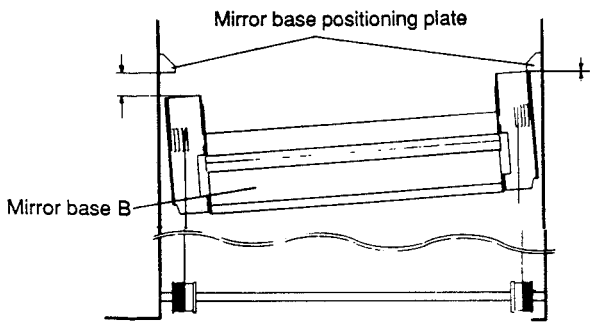
- When the mirror base drive wire is replaced.
- When mirror base A or mirror base B is replaced.

① Manually rotate the mirror base drive pulley to make mirror base B in contact with the mirror base positioning plate. If the front frame side of mirror base B and the rear frame side should make contact with the mirror base positioning plate at the same moment, no adjustment is required as mirror base B in good parallelism.



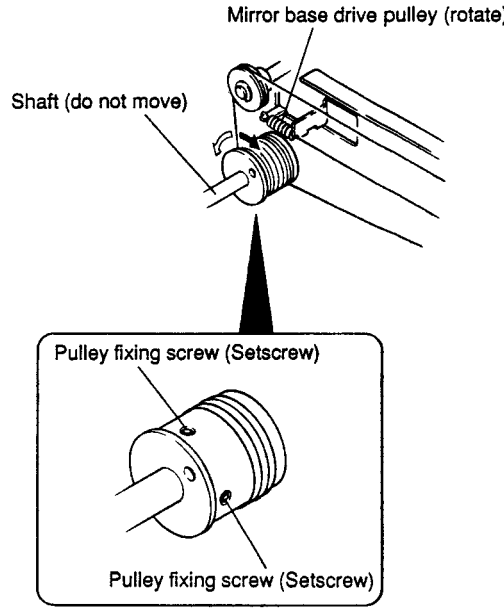


② If the one side of mirror base B is in contact with the mirror base positioning plate, but the other side is not in contact with mirror base B, do the following steps.



③ Loosen the mirror base pulley fixing screws which are on the side that mirror base B is not in contact with the mirror base positioning plate.

④ Manually rotate the side of the mirror base drive pulley mirror base B is not in contact with the mirror base positioning plate and stop it when mirror base B just came in contact with the mirror base positioning plate. (Do not move the flange and the mirror base drive pulley shaft.)



⑤ Tighten the mirror base drive pulley fixing screws.

⑥ Manually rotate the mirror base drive pulley, and release mirror base B from the mirror base positioning plate, then make it contact with the mirror base positioning plate again. At this point, check that the front frame side and the rear frame side of mirror base B make contact each other at the same time.

⑦ If the result is not satisfactory, repeat steps ③ through ⑥ until satisfied result is obtained.

F. Installing the copy lamp unit (mirror base A)

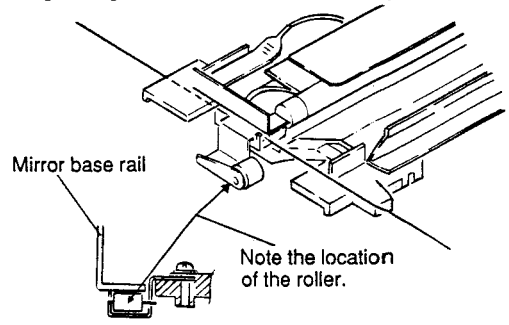
(Positioning mirror base A)

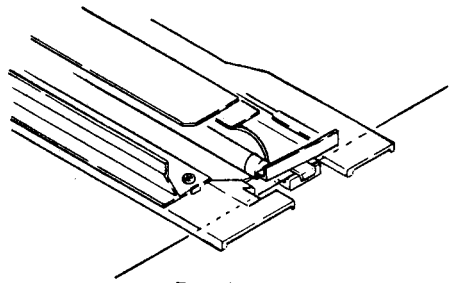
This adjustment is required for one of the following:

- When the mirror base drive wire is replaced.
- When mirror base A or B is replaced.
- When a part inside the dark box is replaced.

Do the reverse sequence of D ① through ⑥ (page 7-6 – 7-7) when installing the mirror base.

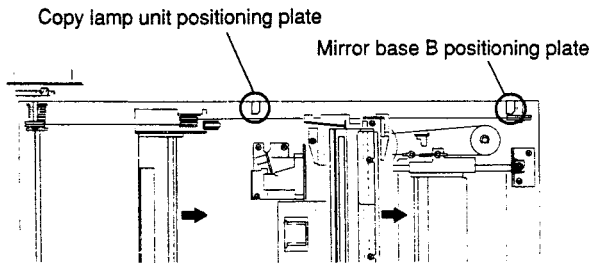
① Place the mirror base A inside the copier, and route the mirror base drive wire on the front and rear frame sides through the mirror base A frame and the mirror base wire holding plate, without tightening the mirror base A wire holding screw.





Front frame side

② Match the copy lamp unit and mirror base B to their positioning plates.



③ In the state of ②, secure the copy lamp unit to the wire.

G. Replacing the mirror base C (No. 4/5 mirror unit)

① Remove the table glass.

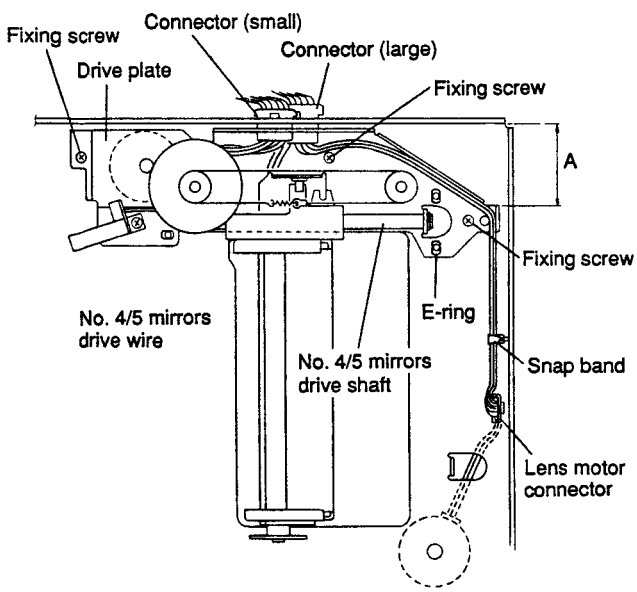
② Remove the dark box cover upper.

③ Remove the upper cover right, the right cover lower, and the rear cabinet.

④ Record the dimension A in the figure. (Measure with a scale.) (This is to control tilting of No. 4/5 mirrors which may cause improper focus and skew.)

⑤ Remove the three fixing screws of No. 4/5 mirrors.

⑥ Remove the connectors (large) and (small) in the rear frame side, and remove the lens motor connector and the snap band at the center. In this state, No. 4/5 mirrors drive plate section, and mirror base C can be removed in a assembly. (Be careful not to scratch the mirror base wire in the rear frame side.)



⑦ No. 4/5 drive section and mirror base C section can be separated by removing No. 4/5 mirrors drive shaft (E-ring) and No. 4/5 mirror drive wire.

Note: When assembling to the machine again, check that three positions marked with (*) are firmly engaged with long holes in No. 4/5 drive plate. Observe dimension A measured in ④.

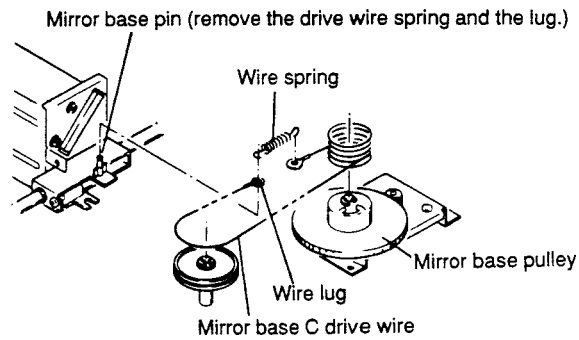
H. Replacing the mirror base C (No. 4/5 mirrors) drive wire

Removing the mirror base C drive wire

① Perform procedures 6-① through ⑥ and remove the No. 4/5 drive plate and mirror base C in a assembly.

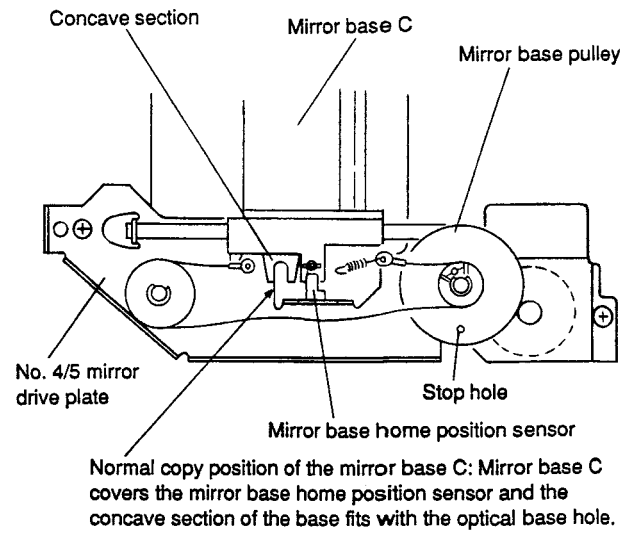
② Remove the mirror base C drive wire spring and metal fixture from mirror base C.

③ Remove the mirror base C drive wire from the mirror base pulley.



(Setting the mirror base C drive wire)

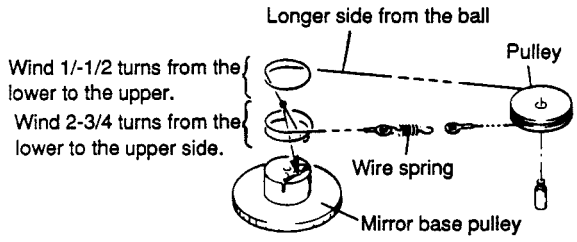
① Move the mirror base C to the normal position (1:1). (Set the mirror base to the location where the mirror base home position sensor activates.)


Concave section
Mirror base C
Mirror base pulley
No. 4/5 mirror drive plate
Stop hole
Mirror base home position sensor
Normal copy position of the mirror base C: Mirror base C covers the mirror base home position sensor and the concave section of the base fits with the optical base hole.

② Insert an M4 x 10 screw into the mirror base pulley stop hole to hold the pulley.

③ Insert the ball of the mirror base C drive wire in the slit of the mirror base pulley gear. Turn the longer side of the wire from the ball clockwise 1 1/2 turns from the lower to the upper side and put the lug on the mirror base pin through the pulley.

④ Turn the shorter side of the wire counterclockwise 2 3/4 turns from the lower to the upper side around the mirror base pulley gear. Put the lug on the wire spring and insert the lug into the mirror base pin.

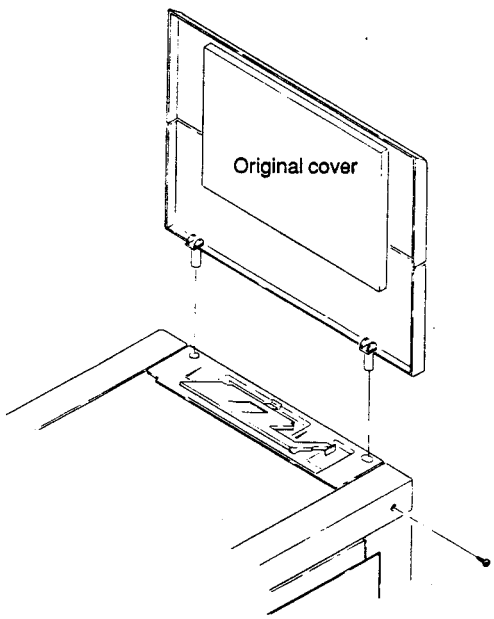

Longer side from the ball
Pulley
Wind 1/-1/2 turns from the lower to the upper.
Wind 2-3/4 turns from the lower to the upper side.
Wire spring
Mirror base pulley

⑤ Remove the mirror base pulley gear holding screw.

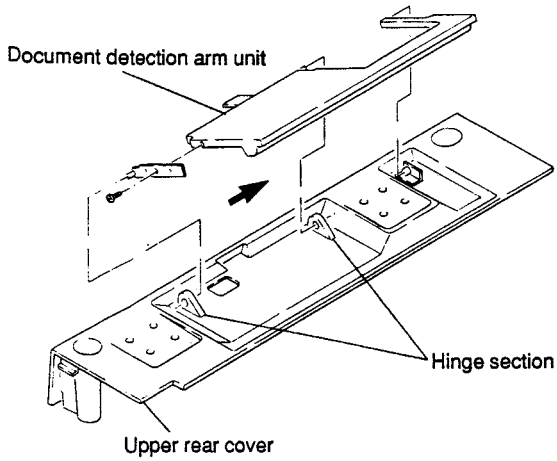
⑥ Manually turn the mirror base pulley gear to shift the mirror base C to the enlarge copy or reduce copy position (paper entry side) to check that the wire is properly set and moves smoothly.

I. Removing the light emitting PWB

① Remove the original cover.



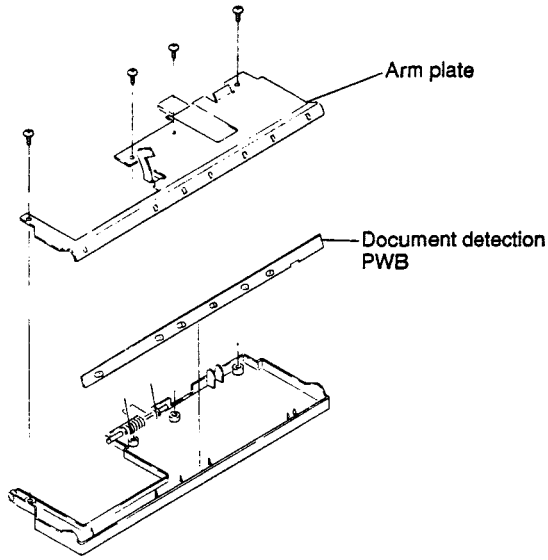
② Remove the hinge section screw which is fixing the document detection arm unit while sliding the document detection arm unit in the arrow direction.



③ Remove the four screws in the rear side of the document detection arm unit, and remove the arm plate.

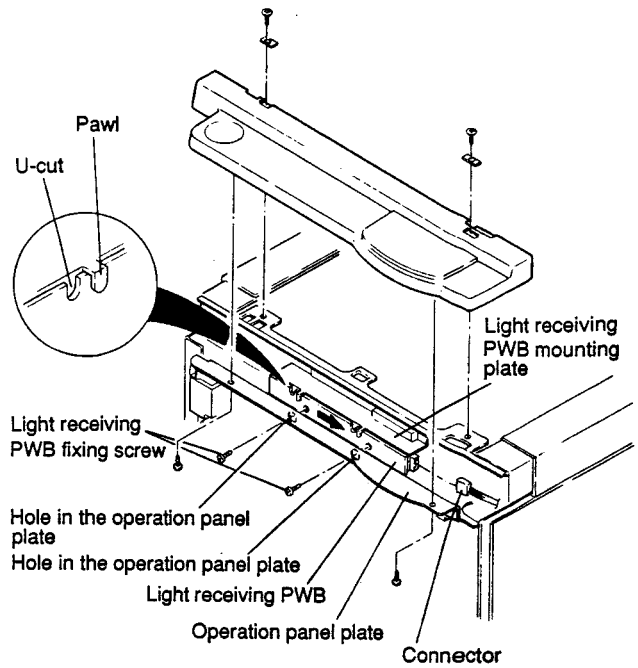
④ Remove the document detection PWB.

* When assembling the document detection PWB, check that the LED is visible from the arm unit slit.



J. Removing the light receiving PWB

① Remove the operation panel. (4 screws)



② Remove the two fixing screws of the light receiving PWB, and remove the connectors of the PWB.

③ Slide the PWB to the right to fit the pawl in the light receiving PWB mounting plate and the U-cut in the PWB.

④ Tilt the light receiving PWB forward to remove.

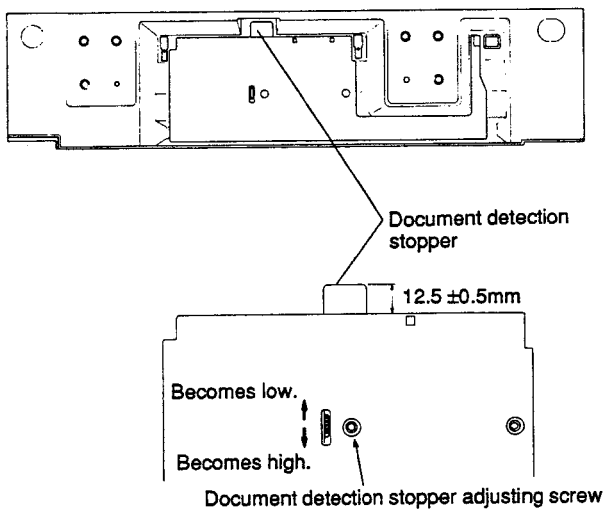
K. Adjustment of the document detection arm unit

The adjustment of the document detection arm unit is required in the following cases:

- When test command 60 (adjustment) cannot be executed.
- When the document detection stopper is replaced.

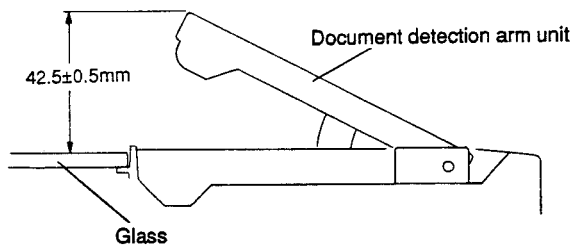
① Angle adjustment of the document detection arm unit

- Open the original cover, loosen the adjusting screw of the document detection stopper projection amount of the document detection arm unit so that the projection amount is 12.5 ±0.5mm.



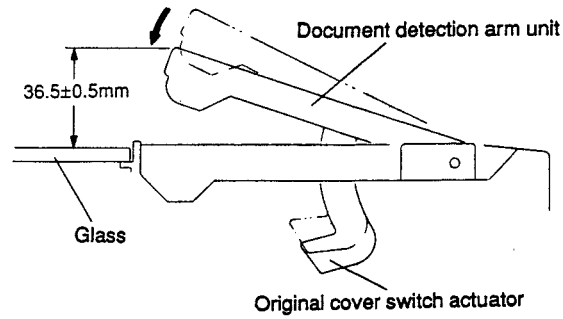
- After adjusting the projection amount, check that the height from the table glass to the top of the document detection arm unit is within 42.5 ±0.5mm.

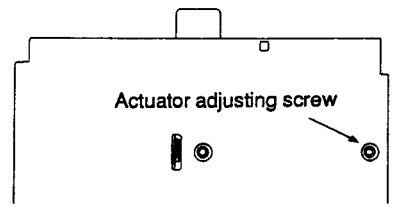
* When the adjustment value is shifted from the reference value, loosen the document detection stopper adjusting screw and readjust.



② Adjust the ON timing of the document cover switch.

- Perform test command 60.
  C → =J → 0 → =J → 6 → 0 → PSW
- Slowly tilt the document detection arm unit. Loosen the original cover switch actuator adjusting screw and slide the actuator to adjust so that the automatic paper select display is turned off with the height from the table glass to the top of the arm unit being 36.5 ±0.5mm. (If the original cover switch ON timing is shifted, the document detection function may not work properly.)

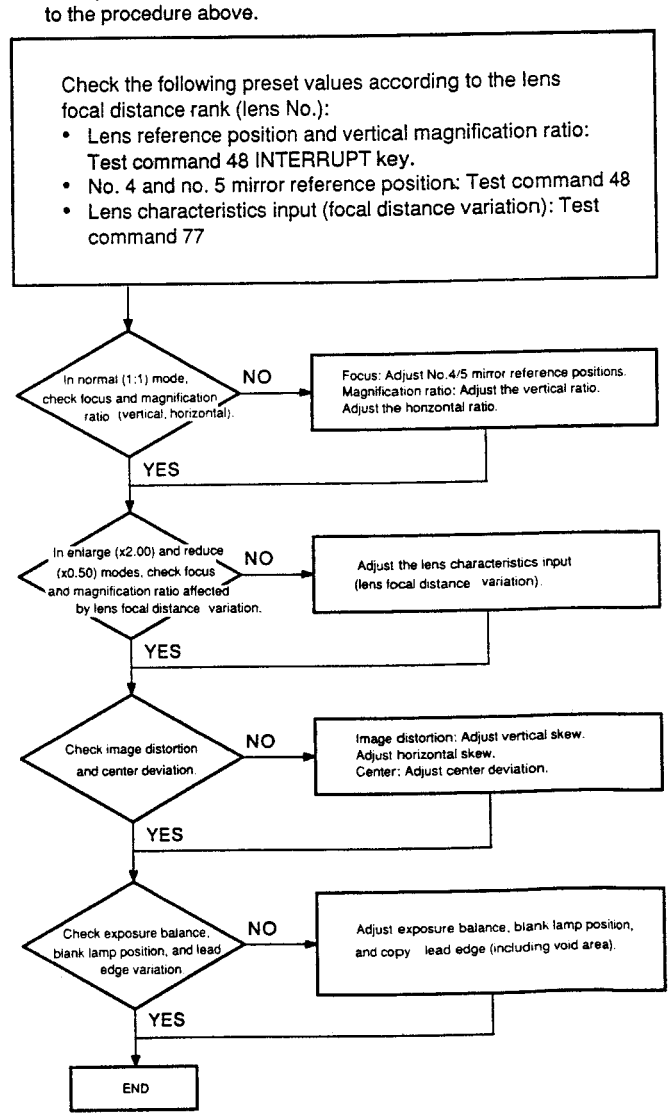




(2) Adjustments

The optical system needs to be adjusted in the following manner:

* Exposure balance, blank lamp position, and copy lead edge can be adjusted independently, but others must be adjusted according to the procedure above.


Check the following preset values according to the lens focal distance rank (lens No.):
• Lens reference position and vertical magnification ratio: Test command 48 INTERRUPT key.
• No. 4 and no. 5 mirror reference position: Test command 48
• Lens characteristics input (focal distance variation): Test command 77
In normal (1:1) mode, check focus and magnification ratio (vertical, horizontal).
NO
Focus: Adjust No.4/5 mirror reference positions.
Magnification ratio: Adjust the vertical ratio.
Adjust the horizontal ratio.
YES
In enlarge (x2.00) and reduce (x0.50) modes, check focus and magnification ratio affected by lens focal distance variation.
NO
Adjust the lens characteristics input (lens focal distance variation).
YES
Check image distortion and center deviation.
NO
Image distortion: Adjust vertical skew.
Adjust horizontal skew.
Center: Adjust center deviation.
YES
Check exposure balance, blank lamp position, and lead edge variation.
NO
Adjust exposure balance, blank lamp position, and copy lead edge (including void area).
YES
END

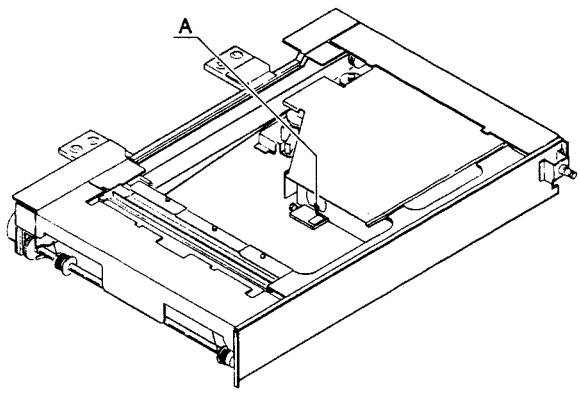
☆ The above flowchart is basically the same as the conventional models (SF-8300 series). The difference is: Test command 77 [CA] is added because test command 77 is divided into lens side shift correction and No. 4/5 mirror shift correction. (This is in order to improve the resolution level in the enlargement or reduction copy mode.)
Test command 77: No. 4/5 mirror unit shift correction
Test command 77 [CA] : Lens shift correction

A. Lens reference position

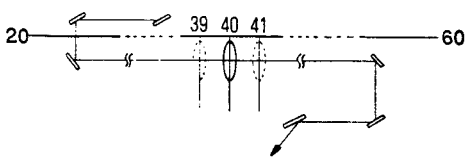
The figure (rank) unique to the individual lens characteristics needs to be entered.
The lens home position is determined with this parameter.

- When the lens is replaced.
- When the mirror base is replaced or when the mounting place is changed.
- When self diag U2 occurs.

(Procedure) Execute test command 48 [=J].
[C] — [=J] — [0] — [=J] — [4] — [8] — [PSW] — [=J] —
When the above key operation is performed, the preset value or "40" is displayed in the copy quantity display.



Enter the value (variation in the distance between the document surface to the lens, OL NO. –3.9 to +3.9) displayed at A in the above figure into the following formula and input the obtained value.
40 – [(Displayed value) x 5] = Correction reference value
Example: When the value is +1.2:
40 – (+1.2 x 5) = 34



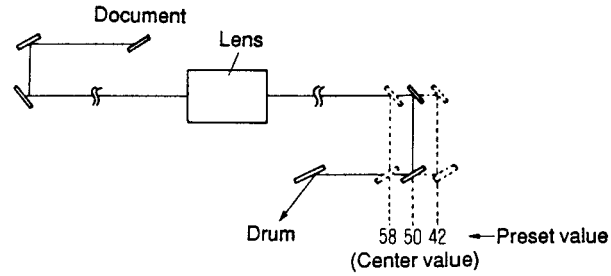
B. Adjusting no. 4/5 mirror reference positions

Similarly to A, the value of the lens rank must be entered. (The No. 4 and No. 5 mirror home positions are determined with this parameter.)

- When the lens is replaced.
- When the mirror base is replaced or when the mounting place is changed.
- When self diag U2 occurs.

(Procedure)
[C] — [=J] — [0] — [=J] — [4] — [8] — [PSW]
When the above key operation is performed, the preset value or "50" is displayed in the copy quantity display.

Enter the value (variation in the distance between the document surface to the image forming surface) displayed in section A of the lens unit in to the following formula, and input the obtained value.
50 – [(Displayed value) x 10] = Correction reference value
Example: When the value is +1.2:
50 – (+1.2 x 10) = 38
If the No. 4/5 mirror reference value is larger than the venter value 50, the optical path is increased by moving it opposite to the lens. If shorter, the optical path is decreased by moving it closer to the lens.

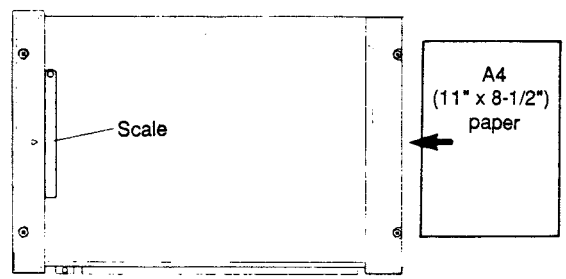


C. Adjusting the vertical copy magnification ratio

This adjustment must be performed under the state where mirror bases A, B and C are parallel and the focuses are properly set.
This adjustment must be performed in the following cases:

- When the lens home position sensor (LHPS) position is moved or the sensor is replaced.
- When the lens is replaced.
- When the mirror base is replaced or its position is changed.
- When the main PWB is replaced.
- When diagnostic status U2 occurs.

① Place a scale on the document table as shown below:

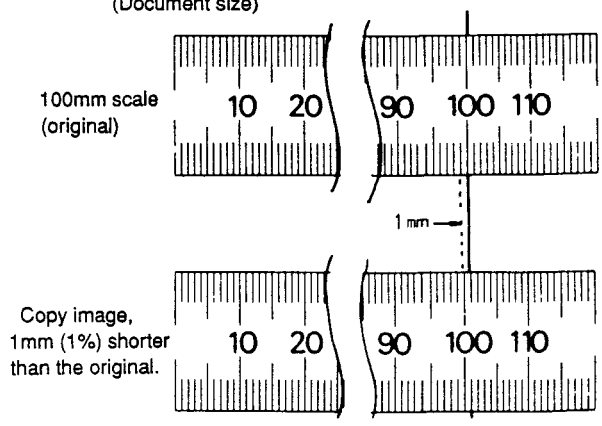


② Make a normal (1:1) copy on A4 (11" x 8 1/2") paper.

③ Compare the length of the copied scale image with the actual length of the scale.

④ Obtain the vertical copy magnification ratio correction factor from the following formula:

$$\text{Vertical magnification ratio correction factor} = \frac{\text{(Document size)} - \text{(Copy image size)}}{\text{(Document size)}} \times 100\%$$



Vertical magnification ratio correction factor = $\frac{100-99}{100}$ x 100
= (0.1%)

⑤ Execute test command 48.
With the key operation of [C] → [=] → [0/◊] → [=] → [4] → [8] → [PSW] → [=] the previous preset value of the vertical magnification ratio adjustment is displayed.

⑥ Obtain the vertical magnification ratio adjustment preset value from the following formula:
Vertical magnification ratio adjustment preset value = former preset value (displayed in ⑤) + vertical magnification ratio correction factor x 10
(Example) Former preset value = 25, correction factor = 1%
Vertical magnification ratio adjustment preset value = 25 + 1 x 10 = 35

⑦ Set the vertical magnification adjustment preset value as follows:
[ ] → [ ] → [PSW]
When the preset value is changed by 1, the copy magnification ratio is changed by 0.1%.

⑧ Make a normal (1:1) copy and compare the copied image length with the scale length.

⑨ When the image length is identical to the actual length, the adjustment is completed. If not, repeat the procedures (2) to (8) until the above condition is satisfied.

⑩ Clear test command 48 by depressing the CLEAR key.

D. Adjusting resolution

① Using test command 48, check that it has been preset to the given focus distance rank.
Press [C] → [=] → [0/◊] → [=] → [4] → [8] → [PSW] to execute test command 48. As the READY lamp comes on, the preset value is displayed.

② If the preset value is not in the memory, set the reference value according to the No. 4/5 mirror reference adjustment procedure in ②.
Make a copy using UKOG-0089CSZZ and check the resolution.

③ To change the currently stored preset value, enter a new value with the key operation of
[ ] → [ ] → [PSW].

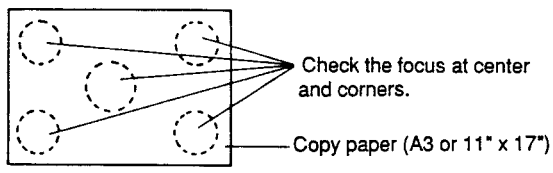
Check method

Check the following after adjusting the No. 4/5 mirror reference position.

① Place the test chart (UKOG-0089CSZZ) or a resolution test chart on the table glass.

② Make a copy on A3 (11" x 17") paper.

③ Check the focus at the center and corners of the copy.



④ Check that the focus is good and resolution is more than 5.0 lines/mm at center and more than 4.5 lines/mm at corners.
If focus is not good, change the no. 4/5 mirror reference adjust preset value and repeat steps ② to ④ until the resolution is within specifications.

E. Adjusting the horizontal magnification ratio

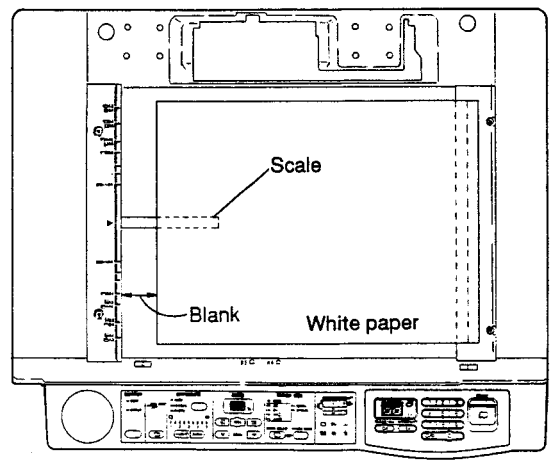
Adjustment is required in any of the following cases:

- When the main PWB RAM is replaced.
- When the diagnostic status U2 occurs.
- When the mirror motor is replaced.
- When the mirror motor control PWB is replaced.

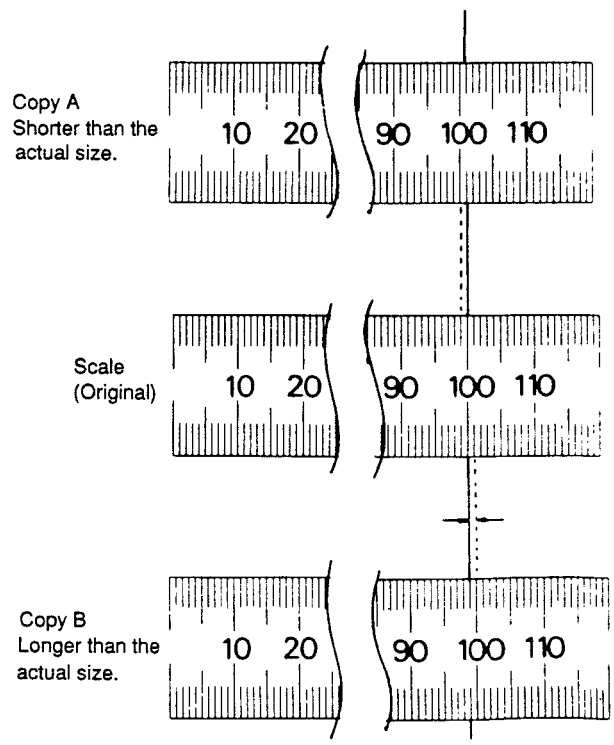
By varying the mirror base scanning speed, the horizontal magnification ratio of the copy is adjusted.

Adjusting procedure

① Place a scale on the document table, make a normal (1:1) copy, and obtain the copy magnification ratio correction factor.
Excute test command 49, and the machine will go into the warm-up cycle, the ready lamp will light up, and the preset value (between 15 ~ 35) will be displayed. (Value 15 through 35 are valid entry values.)



Magnification ratio correction factor (MRCP)
= $\frac{\text{(Document size)} - \text{(Copy image size)}}{\text{(Copy image size)}}$ x 100%



② Change the displayed value with the value obtained by the copy magnification ratio correction factor (in procedure ①).
(Input value) = (Previous value) + (Magnification ratio correction factor) [%] x 10
(Example) If the previous value is 25, you will get the following input values for (Ex-1) of ① and (Ex-2).

- Ex-1: 35 = 25 + 1 x 10
- Ex-2: 15 = 25 + (–1 x 10)

When the print switch is pressed after entering the value, the value is stored in memory and the READY lamp goes out.

③ Cancel test command 49.
Note: The preset value input is restricted to the range of 5 to 35.

F. Entry of variable shift correction value (Test command 77 or 77 [CA])

(Entering the lens characteristics)

Since each lens has its focal distance variation, the lens moving distance in the enlargement and reduction mode must correspond to its focal distance. If the lens moving distance in the enlargement and or reduction mode is fixed regardless of the lens focal distance, the copy magnification ratio will fluctuate according to the lens focal distance variation.
To prevent this, a lens focal distance rank (refer to the comparison table) is stored by test command, and the lens moving distance in the enlargement and reduction mode is determined by the data to make a proper magnification copy.

(When the lens is replaced)

① Obtain the correction value for the lens value from the comparison table of the lens value and test command input value.
Execute test command 77.
[C] → [=J] → [0/◊] → [=J] → [7] → [7] → [PSW]
The READY lamp will light up and the preset value (between 1 – 21) will be displayed.

② Enter the new value.
Example: When the lens display value +1.2, the correction value "14" is obtained from the comparison table. Then enter [1] → [4] → [PSW].
Similarly press
[C] → [=J] → [0/◊] → [=J] → [7] → [7] → [CA] → [PSW] to execute test command 77 [CA], and enter "14."

(When the focus or magnification ratio is not correct)

If the focus of magnification ratio is not correct with the above correction value, perform the following procedure.
The correction value of test command 77 is basically the same as that of test command 77 [CA]. If, however, the focus or magnification ration is nor correct, perform the following procedure:
When the focus is not correct: Change the value of test command 77 by 1 rank.
When the magnification ratio is not correct: Change the value of test command 77 [CA] by 1 rank.

☆ Test command 77 is for no. 4/5 mirror shift correction.
Test command 77 [CA] is for lens shift correction (magnification ratio).

Lens display value	Test command 48 input value	Test command 48 [=J] input value	Test command 77 magnification ratio correction (No. 4/5 mirror)	Test command 77 [CA] magnification ratio correction (lens)	
+4.0	10	20	21	21	
3.9	11	21			
3.8	12	21			+3.8
3.7	13	22	20	20	+3.7
3.6	14	22			
3.5	15	23			
3.4	16	23			+3.4
3.3	17	24	19	19	+3.3
3.2	18	24			
3.1	19	25			
3.0	20	25			+3.0
2.9	21	26	18	18	+2.9
2.8	22	26			
2.7	23	27			
2.6	24	27			+2.6
2.5	25	28	17	17	+2.5
2.4	26	28			
2.3	27	29			
2.2	28	29			+2.2
2.1	29	30	16	16	+2.1
2.0	30	30			
1.9	31	31			
1.8	32	31			+1.8
1.7	33	32	15	15	+1.7
1.6	34	32			
1.5	35	33			
1.4	36	33			+1.4
1.3	37	34	14	14	+1.3
1.2	38	34			
1.1	39	35			
1.0	40	35			+1.0
0.9	41	36	13	13	+0.9
0.8	42	36			
0.7	43	37			
0.6	44	37			+0.6
0.5	45	38	12	12	+0.5
0.4	46	38			
0.3	47	39			
0.2	48	39			+0.2
+0.1	49	40	11	11	+0.1
0	50	40			
—0.1	51	40			–0.1
0.2	52	41	10	10	–0.2
0.3	53	41			
0.4	54	42			
0.5	55	42			–0.5
0.6	56	43	9	9	–0.6
0.7	57	43			
0.8	58	44			
0.9	59	44			–0.9

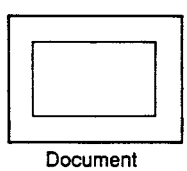
Lens display value	Test command 48 input value	Test command 48 [=J] input value	Test command 77 magnification ratio correction (No. 4/5 mirror)	Test command 77 [CA] magnification ratio correction (lens)	
1.0	60	45	8	8	−1.0
1.1	61	45			
1.2	62	46			
1.3	63	46			−1.3
1.4	64	47	7	7	−1.4
1.5	65	47			
1.6	66	48			
1.7	67	48			−1.7
1.8	68	49	6	6	−1.8
1.9	69	49			
2.0	70	50			
2.1	71	50			−2.1
2.2	72	51	5	5	−2.2
2.3	73	51			
2.4	74	52			
2.5	75	52			−2.5
2.6	76	53	4	4	−2.6
2.7	77	53			
2.8	78	54			
2.9	79	54			−2.9
3.0	80	55	3	3	−3.0
3.1	81	55			
3.2	82	56			
3.3	83	56			−3.3
3.4	84	57	2	2	−3.4
3.5	85	57			
3.6	86	58			
3.7	87	58			−3.7
3.8	88	59	1	1	−3.8
3.9	89	59			
−4.0	90	60			

<Comparison table of the lens value and the test command input value>

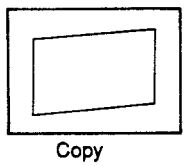
G. Adjusting vertical skew

The adjustment is required in the following cases:

- When the mirror base drive wire is replaced.
- When the No. 1 or no. 2 mirror base is replaced.
- When the following skew copies are produced.

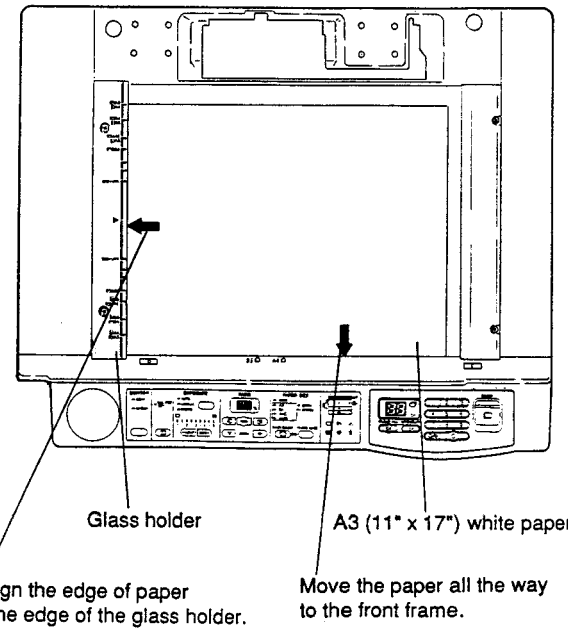


Document



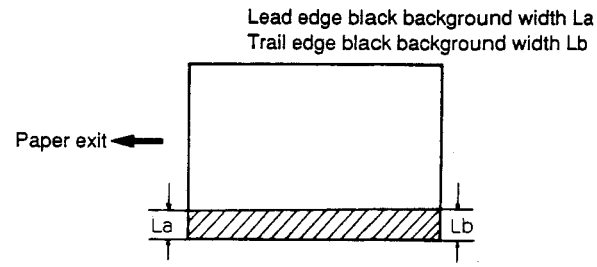
Copy

① Place a sheet of A3 (11" x 17") white paper on the document exposure table so the sides come in contact with the glass holder and the front frame.


Glass holder
A3 (11" x 17") white paper
Align the edge of paper to the edge of the glass holder.
Move the paper all the way to the front frame.

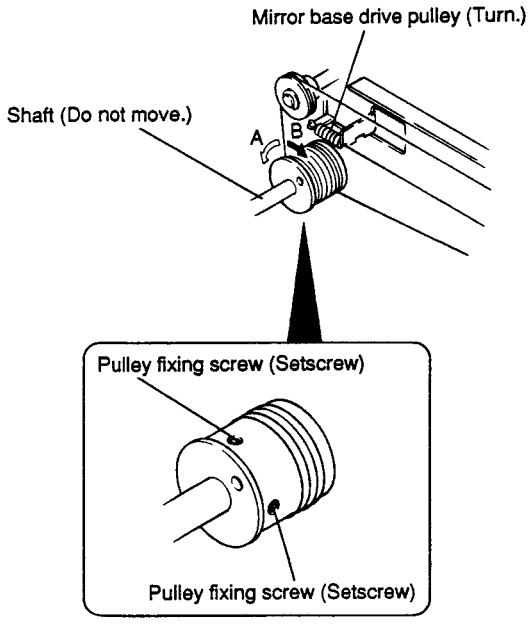
② With the document cover open, make a normal (1:1) copy on A3 (11" x 17") paper.

③ Measure the black background area at the lead edge and trail edge.



If the width of the lead edge black background (La) is he same as the trail edge black background (Lb), no adjustment is required. (In this case, there is no need to perform procedures ④ to ⑦.)

④ Loosen the rear frame side mirror base drive pulley holding screw.
If La is greater than Lb, turn the rear frame mirror base drive pulley in arrow direction A. (Do not move the flange and mirror base drive pulley shaft.)
If La is smaller than Lb, turn the rear frame mirror base drive pulley in arrow direction B. (Do not move the flange and the mirror base drive pulley shaft.)



⑤ Tighten the mirror base drive pulley screw to secure the mirror base drive pulley to the flange.

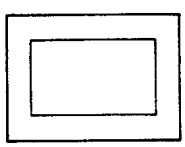
⑥ Perform procedures ① to ③.

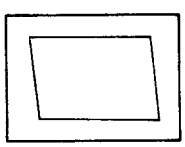
⑦ If La is not equal to Lb, perform ④ and ⑤. (If La equals Lb, the adjustment has been completed.)
Repeat steps ① through ⑥ until La equals Lb.

H. Adjusting horizontal skew

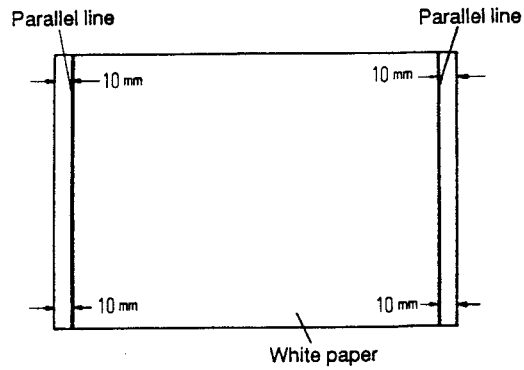
If a horizontal skew (verticality to the scanning direction) is met without skew in the mirror base scanning direction, you can adjust the horizontal skew by adjusting the height of the No. 2/3 mirror base rail using the eccentric screw of the No. 4/5 mirror base unit.
This adjustment is required for any of the following reasons:

- When the mirror base drive wire is replaced.
- When the No. 1/2 mirror base is replaced.
- When the No. 2 mirror base rail is replaced or the location is changed.
- When the copy shown below is produced.

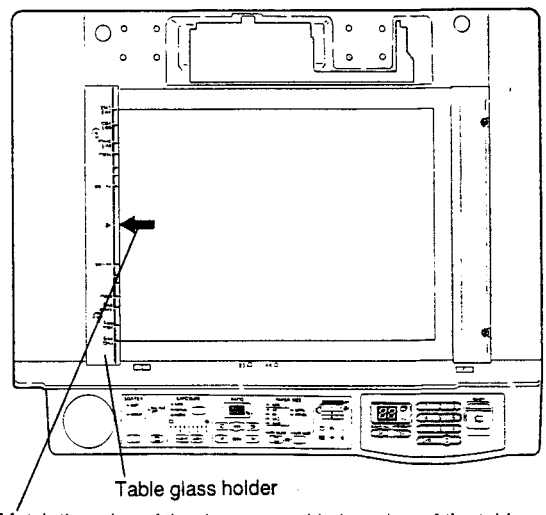

Document


Copy

① Preparing document for adjustment
Draw parallel lines 10mm from both edges of A3 (11" x 17") white paper. (This must be done accurately.)



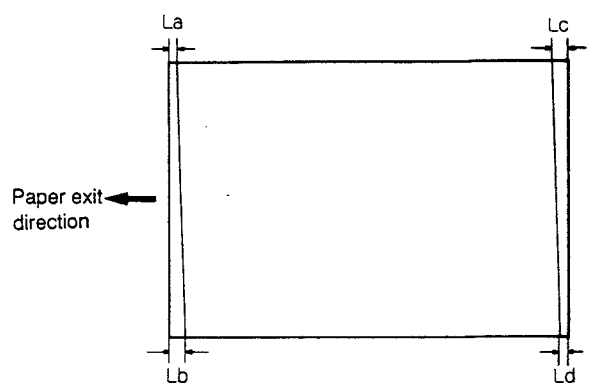
② Set the document prepared in ① on the document exposure table as shown below:



Match the edge of the document with the edge of the table glass.

③ Make a normal (1:1) copy on A3 (11" x 17") paper.

④ Measure the distance from the copy paper edge to the line at four corners (La, Lb, Lc, Ld).



Adjustment is not required if La equals Lb and Lc equal Ld.

Adjusting procedure

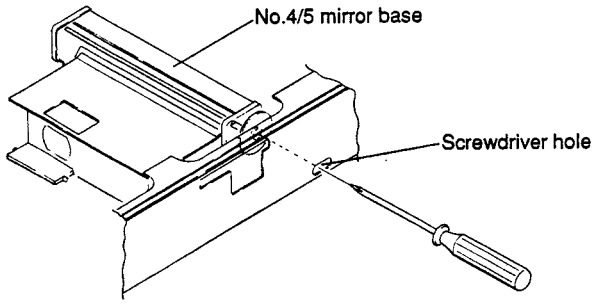
If La > Lb (Lc < Ld):
Raise the front frame side of the no. 4/5 mirror base in arrow direction A.

If La < Lb (Lc > Ld):

Lower the front frame side of the no. 4/5 mirror base in arrow direction B.

Take note how far the eccentric screw is rotated. a full turn of the eccentric screw changes the height by 2mm. that is, a 4m deference occurs between La and Lb.

* Open the front panel and make the adjustment through the adjusting hole.



If adjustment cannot be achieved with the above procedure, perform the adjustment in the following manner.

Adjusting procedure

① Move mirror base B rail up and down to adjust.

If La is greater than Lb: Move the paper exit side mirror base B rail up by half the difference of La – Lb.

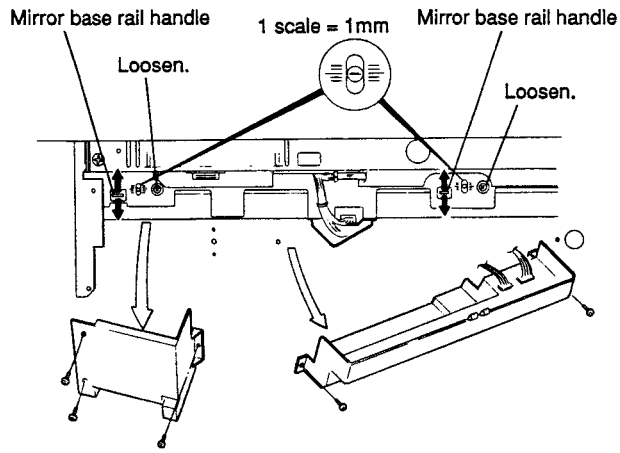
If La is smaller than Lb: Move the paper exit side mirror base B rail down by half the difference of La – Lb.

(Example) If La is 12mm and Lb is 9mm, move the paper exit side mirror base B rail up by 1.5mm.

If Lc is greater than Ld: Move the paper entry side mirror base B rail down by half the difference of Lc – Ld.

If Lc is smaller than Ld: Move the paper entry side mirror base b rail up by half the difference of Lc – Ld.

(To move the mirror base rail, hold the mirror base handle.)



Remove the main switch cover.

② Do adjustment in above step ① so that La equals Lb and Lc equals Ld.

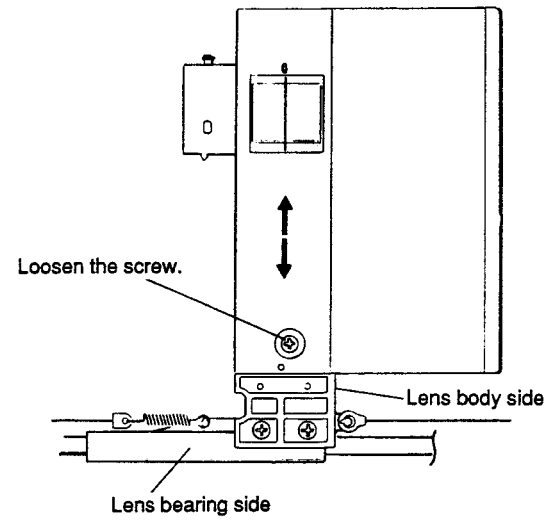
③ After the adjustment has been completed, manually rotate the mirror base drive pulley to make a full scan of the mirror bases A and B to check that the mirror bases do not make contact each other.

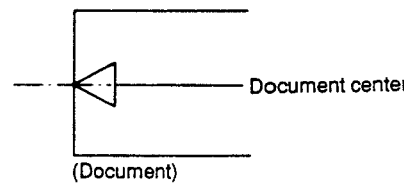
Note: If the mirror base rail is moved excessively, the mirror bases may make contact each other.

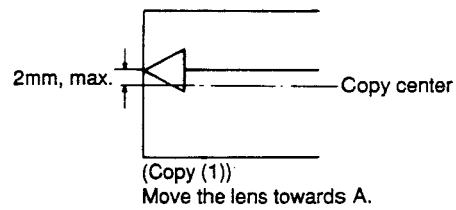
I. Adjusting center deviation

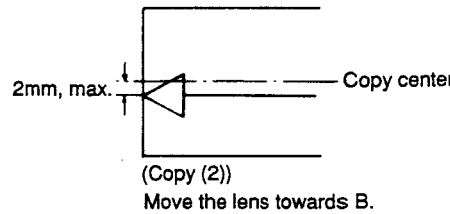
Center deviation can be adjusted by moving the lens in the arrow direction so that the difference between the copy center image and the document center image may be less than 2mm. make a normal (1:1) copy and compare the center line between the original document and the copy.

Note: After the lens was moved, it is necessary to adjust the blank lamp position because blank lamp center position is affected when the document center reference position is changed.



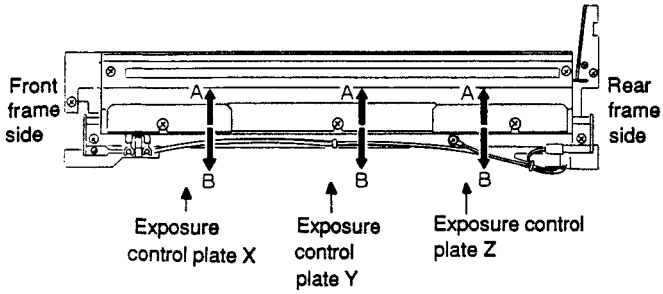




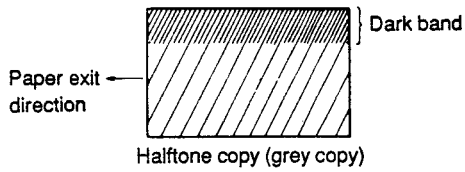


J. Adjusting exposure balance

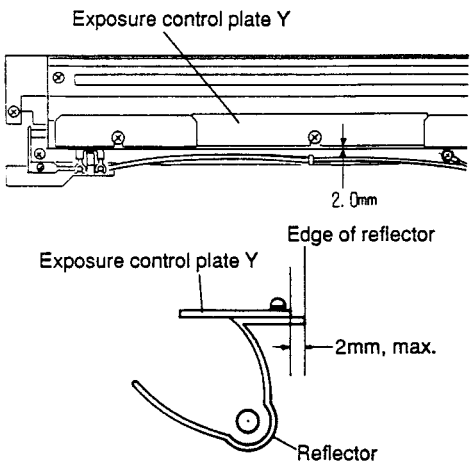
Make a half tone copy. Move the exposure control plates X, Y, and Z in the arrow direction. Moving in the direction A makes a darker exposure, and moving in the direction B makes a lighter exposure.



Example: If the copy as shown below is produced, move the exposure control plate X in the direction B to adjust the exposure balance.



The exposure control plate Y must be adjusted within 2mm from the edge of the reflector.



K. Adjusting the copy lead edge

The copy lead edge can be adjusted with test command 50 or 58.
(Normal copy) Image loss: 0 ~ 3mm
Void area 1 ~ 3mm

The copy lead edge adjustment is required in the following cases:

- When the mirror hole position sensor (MHPS) is replaced or its location is changed.
- When the mirror base is replaced.
- When the resist roller or the resist roller clutch is replaced.
- When the automatic document feeder is installed or removed.
- When the main control PWB is replaced.

(When test command 50 is used)

Use test command 50 to adjust the ON timing of the RRC. When the mirror base starts scanning and the mirror home position sensor (MHPS) turns off, the time and pulses are counted by the CPU and RRC turns on as the proper timing as determined by test command 50.
Time interval from MHPS off to RRC on depends on values from enlargement, normal, and reduction modes.

Keys and displays during execution of test command 50

In this test command, the following keys and displays perform special functions.

Reduction key: makes the magnification ratio 50%.
Enlargement key: Makes the magnification ratio 200%.

Zoom-up key:
Pressing the zoom-up key turns the display in the copy quantity display as A → b → C → A →. The set value corresponding to the display will be displayed in the copy quantity display.

A : RRC-A set value
b : RRC-B set value
C : Void amount set value

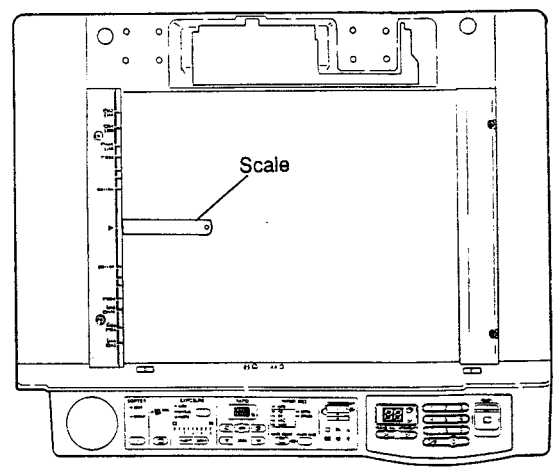
When the zoom-up key is pressed, the previously displayed value is stored in memory.

Zoom-down key:
Pressing the zoom-down key turns the display in the copy quantity display as A → C → b → A →. The set value corresponding to the display will be displayed in the copy quantity display. The other effects are the same as the zoom-up key.

Display section:
During execution of test command 50, the RRC-A set value is displayed in the copy quantity display and "10A" is displayed in the magnification ratio display. The upper two digits of the display shows the copy magnification ratio (100%), and the lowest digit shows that the RRC-A set value is displayed.

Adjusting procedure

① Place a scale on the document exposure table as shown below:



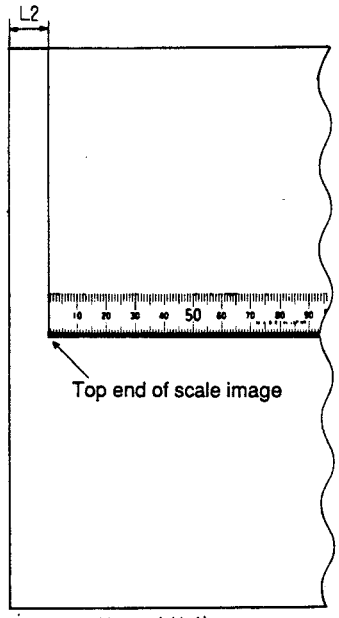
② Press keys in order of
[C] → [=⌟] → [0/◊] → [=⌟] → [5] → [0/◊] → [PSW] to execute test command 50. As the READY lamp comes on, a preset value between 9 and 99 will be displayed.
This is the content of RRC-A memory.

③ Set the values of A and b to zero and make copies in normal mode and 200% enlargement mode.

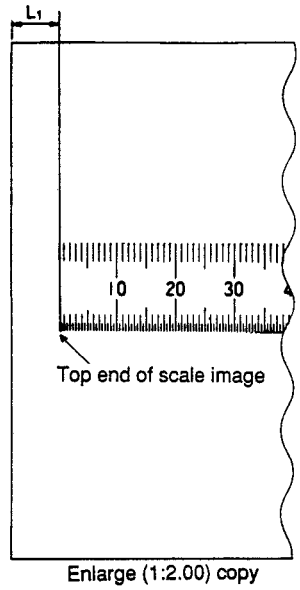
- [0/◊] → [0/◊] → [Zoom-up] → [0/◊] → [0/◊] → [PSW]
  (A normal copy is produced.)
- [Enlargement] → (READY after lens shift) → [PSW]
  (A 200% copy is produced.)

④ Measure the distance between the paper lead edge and the image (scale) lead edge in the above copies, and obtain RRC-A and RRC-B from the formulas below:

If the RRC-A preset value is not proper the lead edge position differs in each magnification ratio. RRC-B is the preset value to control RRC ON timing to fit the drum image lead edge with the lead edge of transfer paper.



Normal (1:1) copy



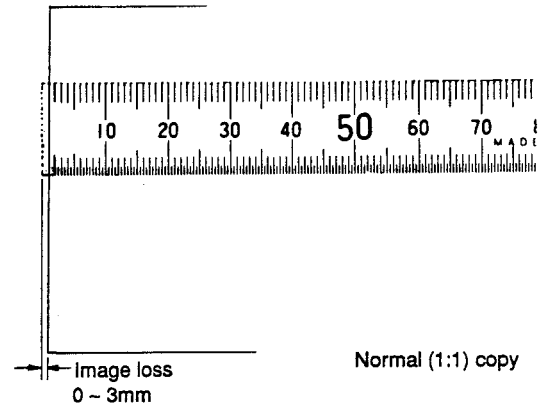
Enlarge (1:2.00) copy

- L1: 200% lead edge shift [mm]
- L2: 100% lead edge shift [mm]
- RRC-A = 8.313 x (L1 – L2)
- RRC-B = 20.190 x L2 – 10.095 x L1

⑤ Enter the obtained values of RRC-A and RRC-B in the same manner as ③.

⑥ Make copies in 200%, 100% and 50% mode, and check variations between each two modes. (About 1.0mm)
If the variations is too great, repeat procedures from ③ again.

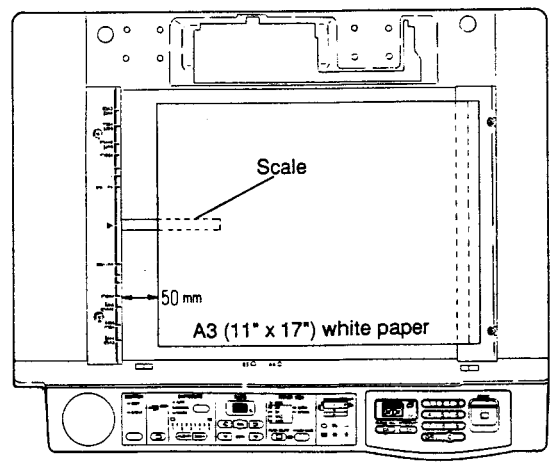
⑦ Make a normal (1:1) copy and check that the lead edge image loss is within 0 to 3mm. If not, change the contents of RRC-A and RRC-B to readjust.



Normal (1:1) copy

Note; The above image loss adjustment value is the adjustment value for test command 50 and not the final adjustment value.

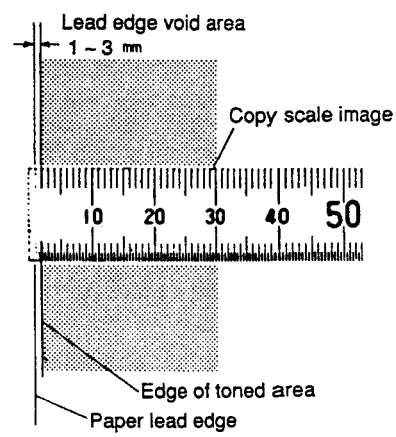
⑧ Place a scale and an A3 (11" x 17") white paper as shown below:



⑨ Press the zoom key to make the lowest digit of the magnification ratio display "C". (void amount adjustment mode)

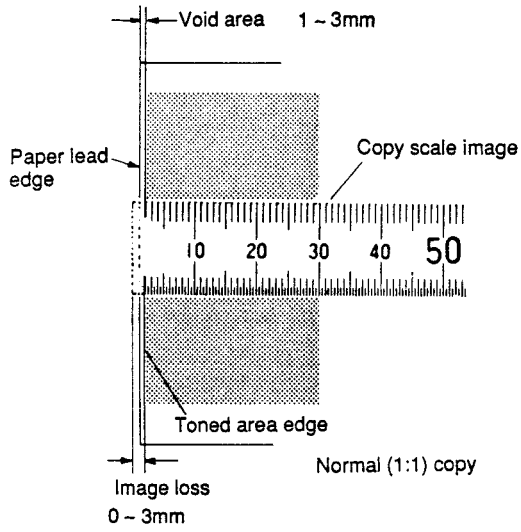
⑩ Make a copy and enter the normal (1:1) copy lead edge void area adjustment set value so that the black background edge is at 1 ~ 3mm scale of the copy scale image.

Press [ ] → [ ] → [PSW], and a copy is produced and the key input is set. When the set value is changed by 1, the void area will change by about 0.2mm. The greater the set value is, the greater the void amount is.



Normal (1:1) copy

⑪ Make a normal copy and check that the image loss and the void area are within the specified range.
(Specified range)
Image loss : 0 ~ 3mm
Void area : 1 ~ 3mm



⑫ Press the CLEAR key to cancel test command 50.

Note: When the RRC-A or RRC-B set value is changed in test command 50, be sure to adjust the copy lead edge void area.

(When test command 58 is used)

In the case of test command 58, the key operation and the display are the same as test command 50.
With test command 58, the lead edge adjustment can be done easily by directly entering L1 and L2 values.

L1 = Distance from the enlarged (1:2.00) copy paper edge to the scale image edge.
L2 = Distance from the normal (1:1) copy paper edge to the copied scale image edge.

The void area can be adjusted using the auto image size key as with test command 50.

Adjusting procedure

① Place a scale on the document table.

② Press keys in order of
[C] → [=⌟] → [0/◊] → [=⌟] → [5] → [8] → [PSW] to start executing test command 58. The machine starts warming-up.

③ The upper two digits of L1 are displayed in the copy quantity display, and "10A" is displayed in the copy magnification ratio display.
The upper two digits of the display in the magnification ratio display shows the magnification ratio (100%), and the lowest digit shows that L1 is displayed in the copy quantity display.

- L1: 200% lead edge shift (OOOmm: 3 digits)
- L2: 100% lead edge shift (xxxmm: 3 digits)

Example of copy quantity display

Example: In the case of 42.5mm, [4] [2] [5] → The display is [2] [5].

④ Using the zoom key and 10 key, set the values of A and b to zero, and make copies in 100% and 200% modes.

- [0/◊] → [0/◊] → [0/◊] → [Zoom-up] → [0/◊] → [0/◊] → [0/◊] → [PSW] (A 100% copy is produced.)
- [Enlargement] → [PSW] (A 200% copy is produced.)

⑤ Measure the distance between the paper lead edge and the image (scale) lead edge) in the 100% and 200% copies. Enter L1 and L2 values with the zoom key and 10 key. With this operation, RRC-A and RRC-B values of test command 50 are automatically calculated and stored in memory.
Input example
Example
L1 = 24.5mm
L2 = 15.0mm
Check that the lowest digit of the magnification ratio display is A, perform the following key operation. [2] → [4] → [5] ("45" is displayed in the copy quantity display.) → [ZOOM] → [1] → [5] → [0] ("50" is displayed.) → [PSW]

⑥ Check and adjust shift, image loss, and void area in the same manner as test command 50.

L. Adjusting document sense level

(Input of document sense level)

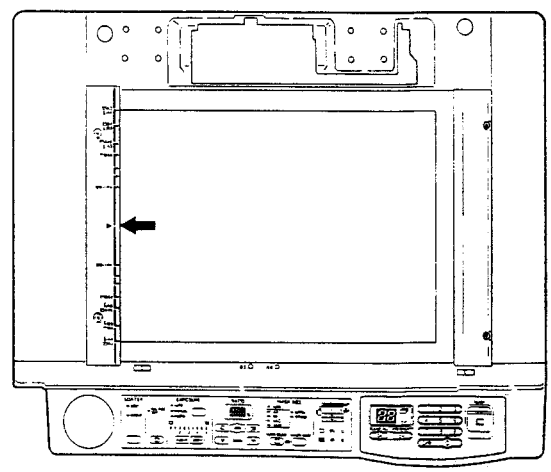
With this test command the sensor threshold value is entered for the sensor to determine the presence of a document. This test command is also used to monitor the sensor on/off state.

① [C] → [=⌟] → [0] → [=⌟] → [6] → [0] → [PSW] → [Auto zoom key]
The READY lamp (RPL) and the auto image size lamp light up.

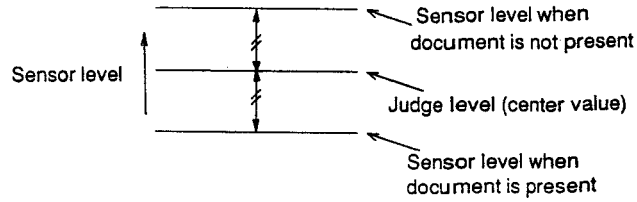
② Open the document cover without placing a document on the glass and depress the PRINT switch.
The READY lamp goes out momentarily and lights up again. The INTERRUPT lamp also lights up simultaneously. The document no-presence sensor level is read into memory.

③ Place an A3 (11" x 17") copy paper on the document table and press the PRINT switch with the document cover left open. The document sensor level is read and the level for document presence is stored in the memory, At the same time, the control returns to the sensor check mode.

* In this case, if there is any abnormality in the sensor level, "CC" is displayed. (The sensor levels can be checked with test command 94.)



<Reference>
The levels of the sensor when a document is present and not present are read and their mean value is read.



(Sensor check mode)

The photo sensor check can be made with test command 60. (After the document sense level check, the machine automatically goes into the check mode.

Check method of the photo sensor

- Key operation:

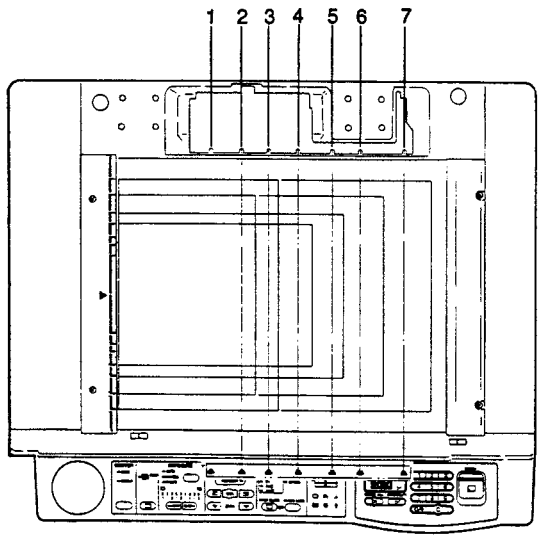
  [C] → [=J] → [0] → [=J] → [6] → [0] → [PSW]

  The document size lamp and the auto paper select lamp light up simultaneously when the machine goes into the check mode. The document size lamp goes off when the light emitting section of the LED PWB is shaded.

  * The photo sensor arrangement is as shown below:

Optical axis	Japan AB series	Outside Japan AB series	Outside japan inch series
1	—	—	—
2	B5	—	—
3	A4	A4	LT
4	B5R	—	—
5	A4R	A4R	LTR
6	B4	B4	LG
7	A3	A3	17"

The auto paper select lamp is for checking open/close of the original cover. (On when open, OFF when close)
When the original cover close is detected, all the document size display lamps are turned off.



(Checking the light reception level and the judgement level)

The light reception level and the judgement level can be checked with test command 94.

① Light reception level display mode

[C] → [=J] → [0] → [=J] → [9] → [4] → [PSW]

- The light reception level during execution of test command 94 is displayed in the copy quantity display.
- After executing the test command, enter the value corresponding to each sensor using numeric keys. The document size display lamp lights up and the light reception level of each sensor can be checked.
- The auto paper select lamp is used for checking the original cover open/close. (ON when open, OFF when close.) In the case of "1," when the original cover is closed, the sensor level is fixed at the preceding value.

② Set level display mode

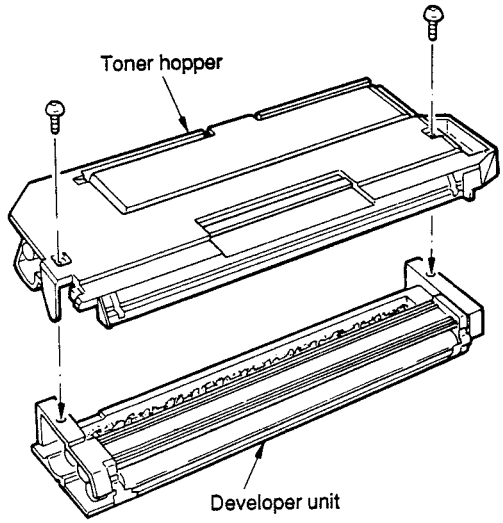
[C] → [=J] → [0] → [=J] → [9] → [4] → [PSW] → [Auto zoom key]

- With the above key operation, the INTERRUPT lamp lights up.
- The sensor levels set with test command 60 are displayed in the copy quantity display.
- After executing test command 94, enter the value corresponding to each sensor using numeric keys. the document size display lamp lights up and the set level of each sensor can be checked.

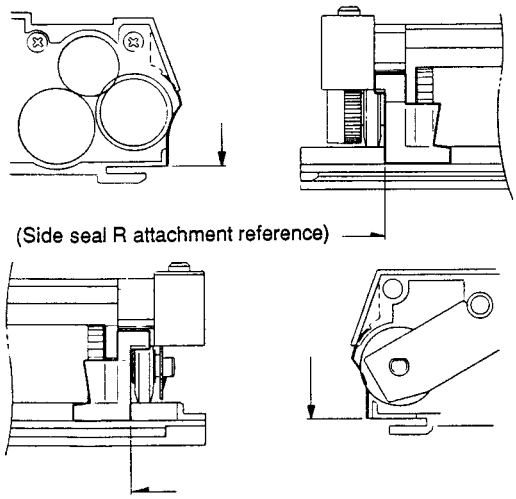
4. Developer unit

A. DV side seals F and R replacement (every 120K copies)

① Remove the two screws connecting the hopper section and the developer tank.



② Replace the DV unit side seals F and R as shown below:

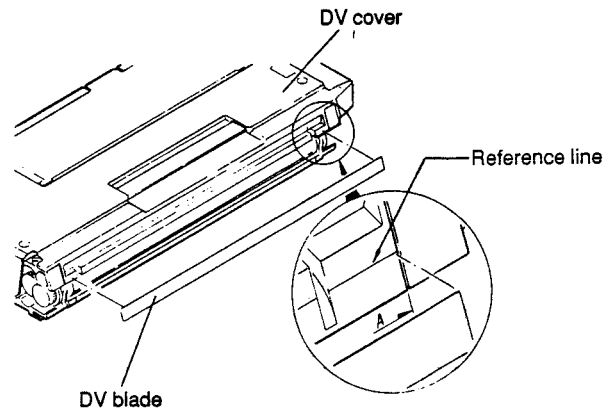


Note: The DV side seals are adjacent to the drum. Be careful not to allow peeling off or defective attachment.

B. DV blade replacement (every 120K copies)

① Remove the old DV blade from the DV cover. (Remove the duplex tape also.)

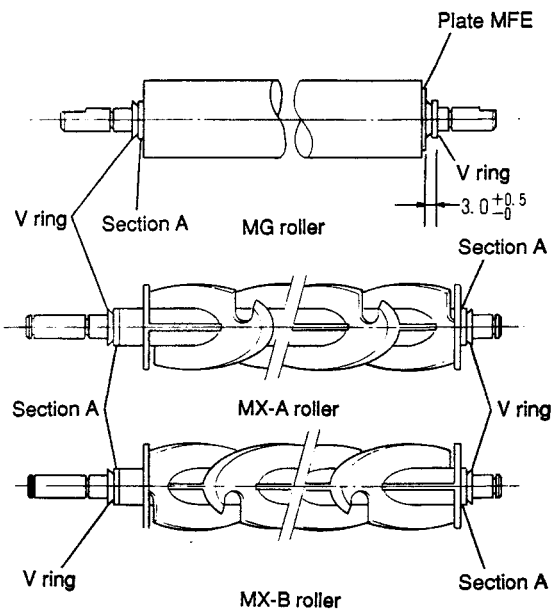
② Install a new DV blade with the base sheet attached on it as shown below. Attach the DV blade to align with A and the reference line (凸 0.2). The sheet must not extend from end surface A. It must not cover the scribed line. The allowance shift is within 0.5mm from the scribed line. The sheet must be attached without wrinkles.



③ Remove the base sheet from the DV blade.

C. V ring attachment

Attach the V rings to the MG roller, the MX-A roller and the MX-B roller as shown below. (Note the installing directions.)

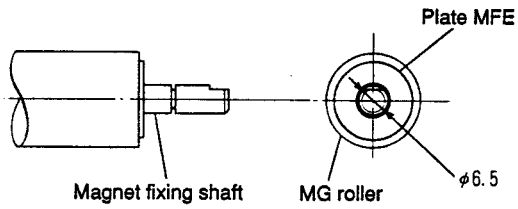


① Note the installing directions of the V rings.

② There must be no clearance between the V ring and section A of each roller.

③ Attach the V ring to the MG roller right side as shown. (3.0 $^{+0.5}_{-0}$)

* Note: When replacing the MG roller, attach plate MFE.



Do not allow the hole (ø6.5) of the plate MFE to make contact with the magnet fixing shaft. Clean and remove oil and dirt from the attachment surface.

* Note: When attaching the MG roller, put the milled surface facing upwards.

D. Doctor gap adjustment

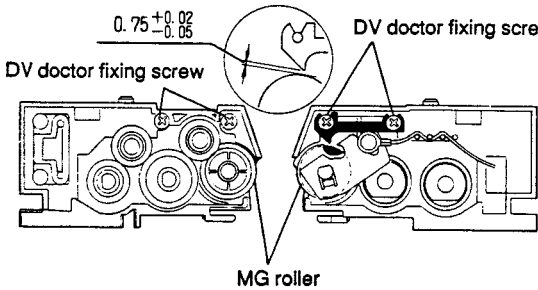
If the clearance between the DV doctor and the MG roller is improper, the following trouble may occur.

- Too low copy density
- Too high copy density
- Toner dusting

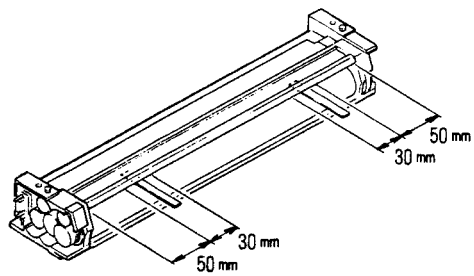
(Procedure)

① Remove the two screws which are connecting the toner hopper and the DV tank, and separate them from each other.

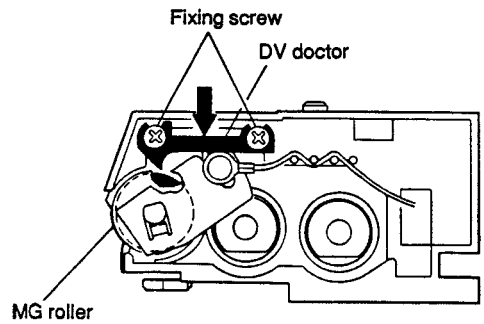
② Loosen the DV doctor fixing screws. (2 pcs. in the rear frame side and 2 pcs. in the front frame side)



③ Insert a 0.75mm thickness gauge between 50mm~80mm from the DV doctor end surface.



④ Push the DV doctor in the arrow direction and tighten the DV doctor fixing screws in the front and the rear frame sides.



⑤ Check that there is a clearance of 0.75 $^{+0.02mm}_{-0.05mm}$ at either end and the center of the DV doctor.

* Note: When inserting a thickness gauge, be careful not to scratch the DV doctor and the MG roller.

E. MG roller main pole position adjustment

If the MG roller main pole position is improper, the following trouble may occur.

- Too low copy exposure
- Toner dusting

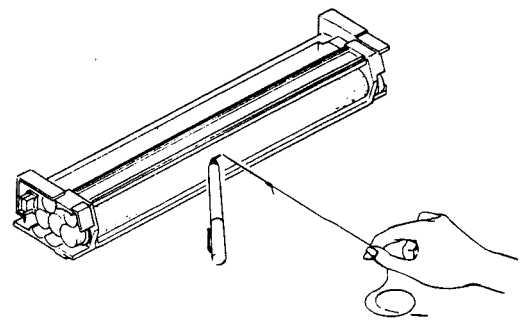
(Procedure)

① Remove two screws which are connecting the toner hopper and the DV tank, and separate them from each other. Place the DV tank on a flat surface.

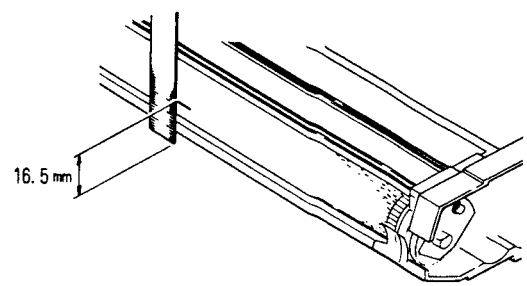
② Arrange a needle with string as shown below:

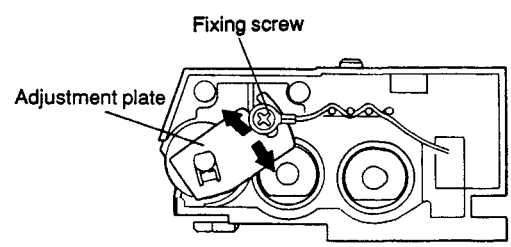
③ Hold the string and bring the needle close to the MG roller. (Since the MG roller is small in diameter, use of a clip is not advisable to position precisely.)

④ Mark the contact position on the MG roller surface with the needle with a pen.



⑤ Check that the distance between the marking position and the Dv tank is 16.5mm.
If the distance is not 16.5mm, loosen the main pole adjustment plate fixing screw, move the adjustment plate in the arrow direction and adjust.

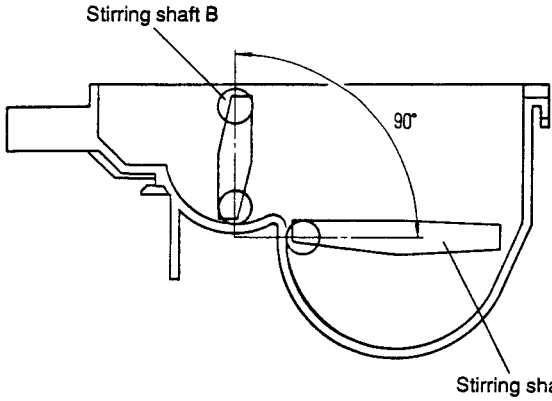




⑥ After adjustment, tighten the screw to fix the adjustment plate.

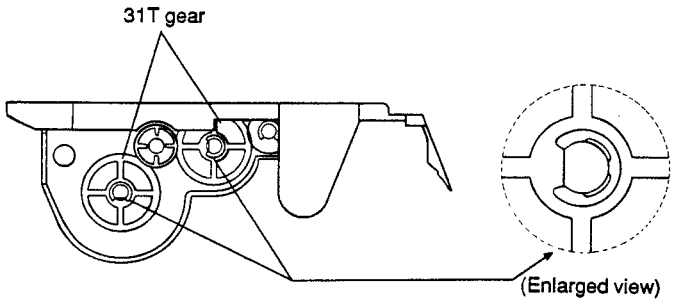
F. Note for installing the toner hopper drive gear (31T) and the stirring shaft

- Be careful to the installing positions of the stirring shafts A and B.



Install so that stirring shafts A and B form 90 degrees as shown above.

- When installing the toner hopper drive gear (31T), be careful to the stop position of the E-ring as shown below: (If the E-ring covers the milled surface, the gear may be easily disengaged.



G. Developer unit color identification resistance

The developer unit resistance is changed according to its color for color identification.

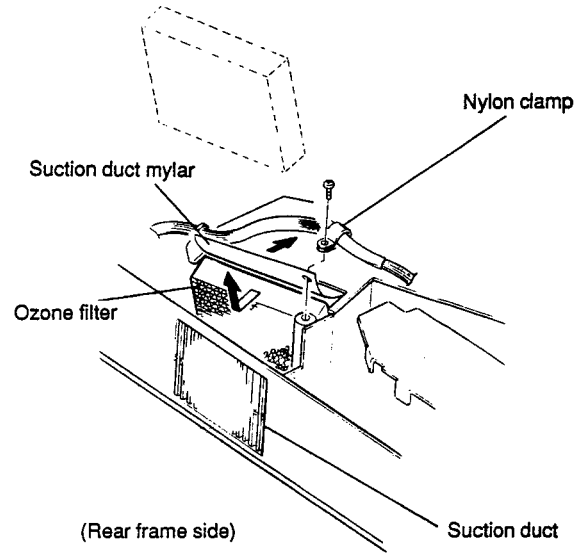
Color	Resistance [KΩ]	Identification signal voltage (DVC) [V]
Black	0	0
Red	6.2	2.25
Blue	8.2	2.56
Brown	12	2.97
Green	24	3.58
Spare	1.4	0.83

5. Suction unit

A. Ozone filter replacement (Every 120K copies)

① Remove the nylon clamp fixing screw.

② Lift the suction duct mylar and remove the ozone cleaner.



③ Insert a new ozone filter completely until it reaches the bottom.

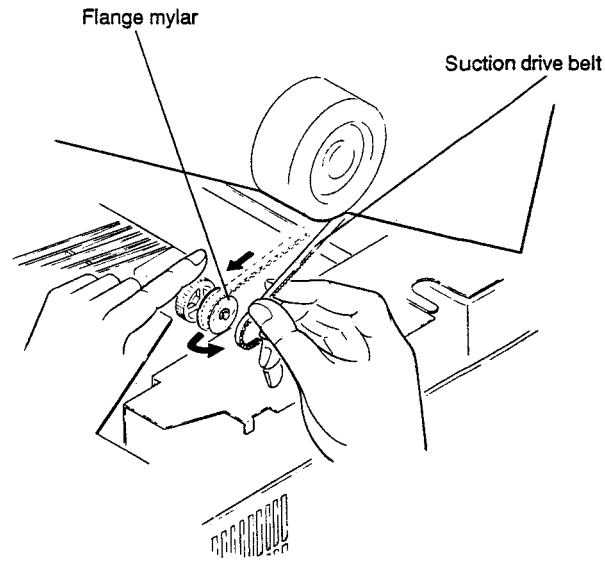
④ Tighten the screw to fix the nylon clamp. (Note the direction and do not pinch the wire.)

B. Suction belt replacement

The suction belt should be cleaned every 30K copies.
Suction belt replacement

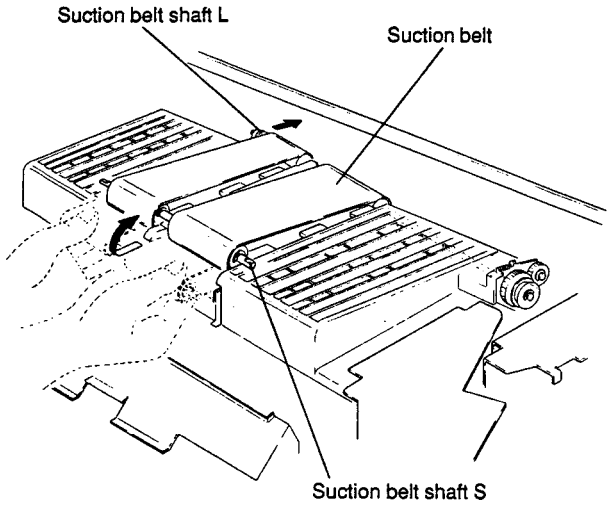
① Open the clamshell, and remove the TC case unit and the fusing unit.

② Remove the suction drive belt. Be careful not to deform the flange mylar.

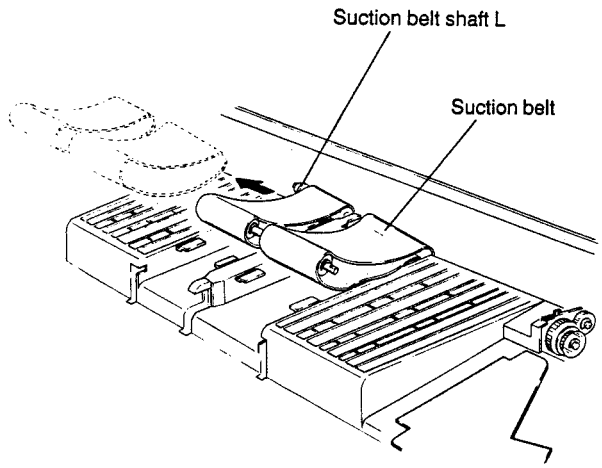


* While turning the drive belt, remove it.

③ Pull the belt shaft S to the paper feed side and remove it from the holder section.



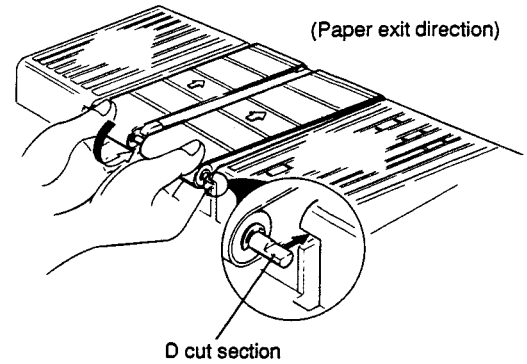
④ Remove the belt shaft L from the holder section, and remove the belt from the shaft.



⑤ Set a new belt on the shaft and put the belt shaft S and L in the holder section.

Note for assembly

- Note the installing direction of the belt. Install so that the arrow mark faces in the paper exit direction (rotating direction).
- Do not pull the belt excessively. When the belt is pulled excessively, it may be stretched out.
- The belt shaft S is of D-shape. When inserting it into the holder section, put the flat surface (cut surface) upwards.
- The belt should not extend from the belt roller.



⑥ For assembly, reverse the disassembly procedure.

⑦ After assembly, turn the drive belt to check that the belt is driven smoothly.

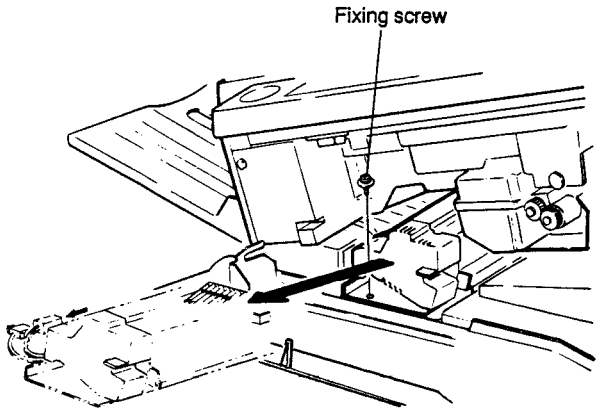
6. Fuser unit

A. Fuser unit removal

① Open the clamshell.

② Remove the fuser unit fixing screw, and hold the fuser unit to slide it in the arrow direction. (Be careful, the fuser unit is may be hot)

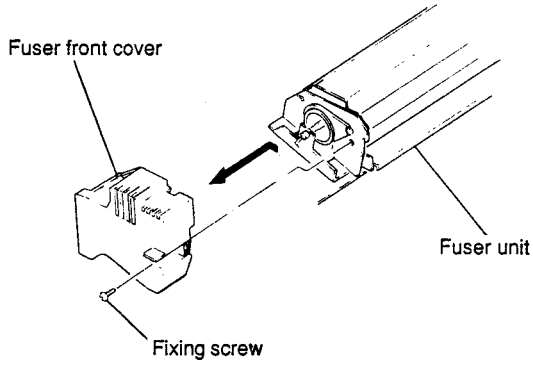
③ Disconnect two connectors (2-pin), and slide unit fowards front.



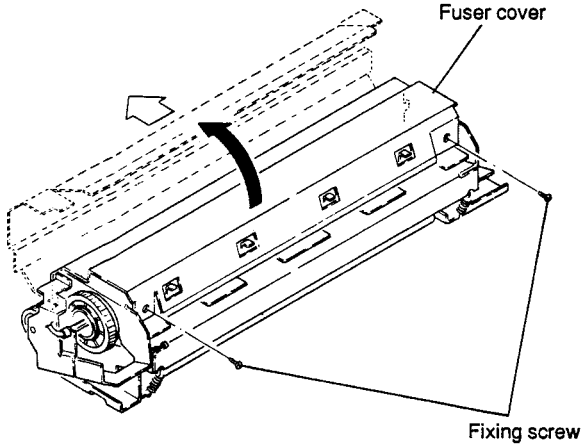
B. Heater lamp replacement

<Removal>

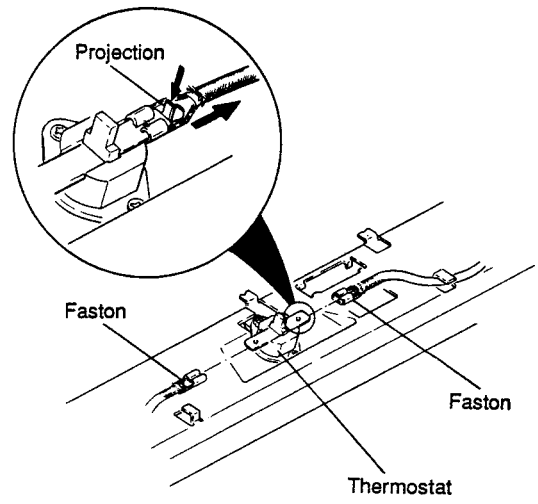
① Remove the fuser front cover fixing screw (1 pc), slide the front cover in the arrow direction to remove.



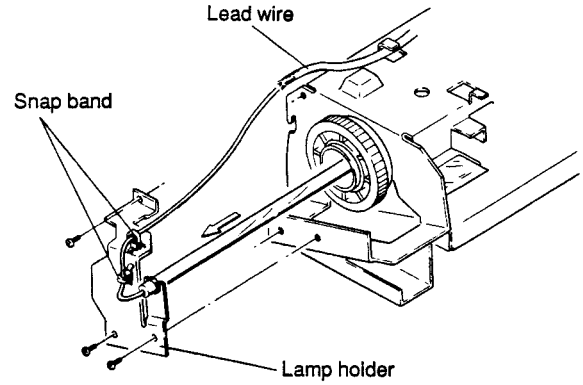
② Remove two fixing screws of the fuser cover, turn the fuser cover in the arrow direction to remove.



③ Pull out the Faston terminal from the thermostat. (While pressing the projection of the terminal, pull it out.)



④ Remove the three screws to remove the lamp holder.

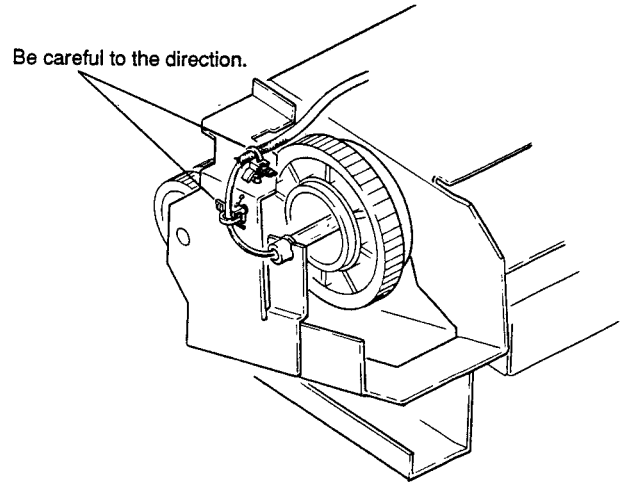


⑤ Pull out the heater lamp with heater lamp holder from the rear frame side.

<Attachment>

For attachment, reverse the removal procedure. When attaching, follow the items below:

- When securing the lamp lead wire, bring the tube close to the fuser frame edge. (Lead wire protection)
- Arrange the harness as shown below. Note the snap band direction.



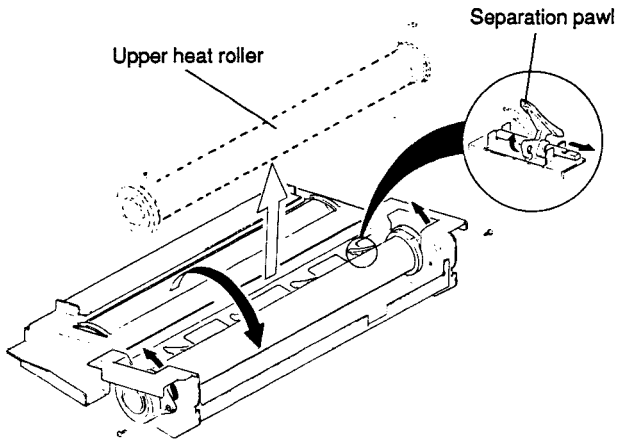
C. Upper heat roller ass'y replacement (every 60K copies)

<Removal>

① Remove the heater lamp.

② Open the fuser unit, separate the separation pawl from the roller, and remove the roller bearing fixing screws (one in the front frame and one in the rear frame).

③ Turn the bearing 90 degrees and take the heat roller out upwards.



<Installation>

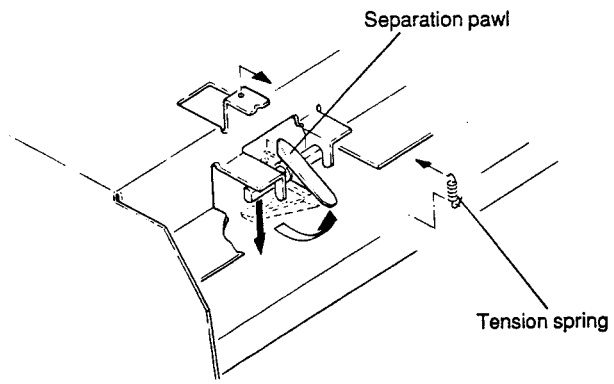
* Carefully arrange the lead wire of the heater lamp.

D. Replacing the upper separation pawl (every 60K copies)

<Installation>

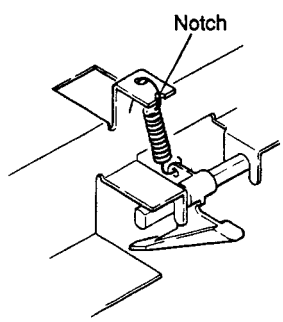
① Remove the fuser unit and remove the fuser cover.

② Remove the tension spring, turn the separation pawl in the arrow direction, and pull it out downward.



<Installation>

When installing, Note the spring hook direction. Check that the hook section is engaged with the notch.



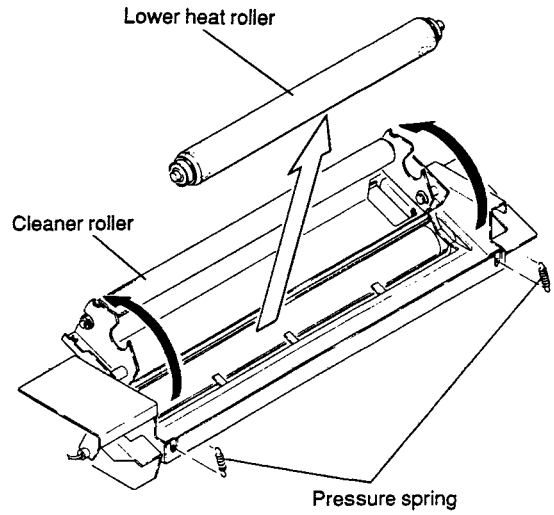
E. Lower heat roller replacement (every 60K copies)

<Removal>

① Remove the fuser unit, and turn the unit upside down.

② Remove the pressure springs (in the front and the rear side).

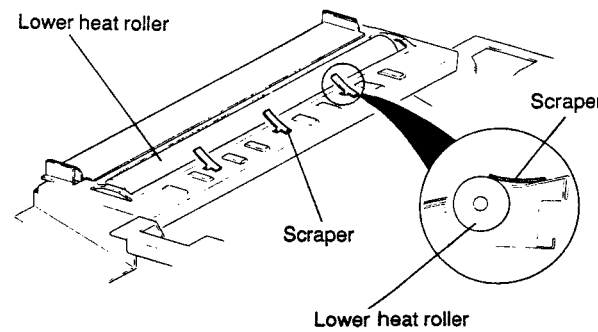
③ Turn the cleaner roller in the arrow direction, and remove the lower heat roller.



<Installation>

Note for installation

- Check that the lower heat roller bearing is properly positioned in the bearing holder.
- Check that the scraper (lower separation pawl) is in contact with the roller.



- Manually rotate the lower heat roller to check that it rotates smoothly. Check that the scraper is not caught by the roller.

F. Upper cleaning roller replacement (every 60K copies)

① Remove the fuser cover.

② Loosen the thermistor fixing screw.

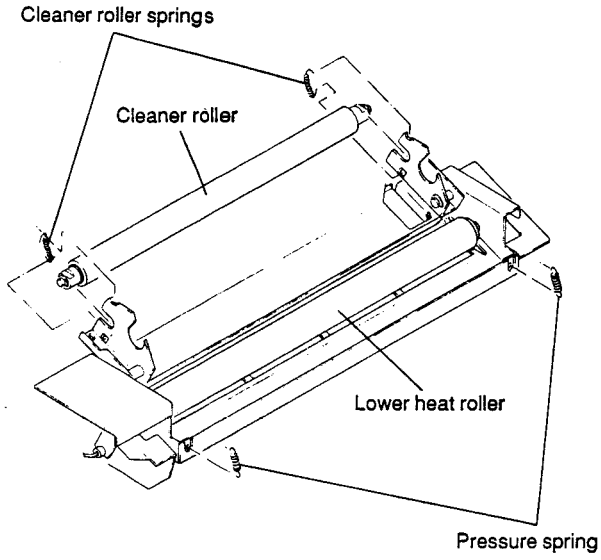
③ Remove the cleaning roller fixing plate, and replace the upper cleaning roller.

G. Cleaning roller replacement (Every 60K copies)

① Remove the fuser unit from the machine, and remove the pressure springs.

② Rotate the cleaner roller in the same manner as the lower heat roller removal.

③ Remove the cleaner roller springs, and replace the roller.

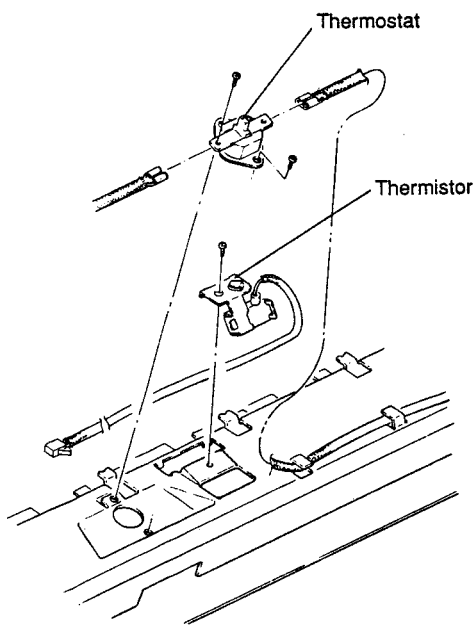


H. Thermistor and thermostat removal

<Removal>

Remove the fuser cover and remove the following fixing screws.

- Thermistor fixing screw (1 pc.)
- Thermostat fixing screws (2 pcs.)



<Check after installation>

- Thermistor
  The thermistor must be in close contact with the upper heat roller.
- Thermostat
  There must be a clearance of 0.75±0.25mm between the thermostat and the upper heat roller when the upper and the lower rollers are pressed.

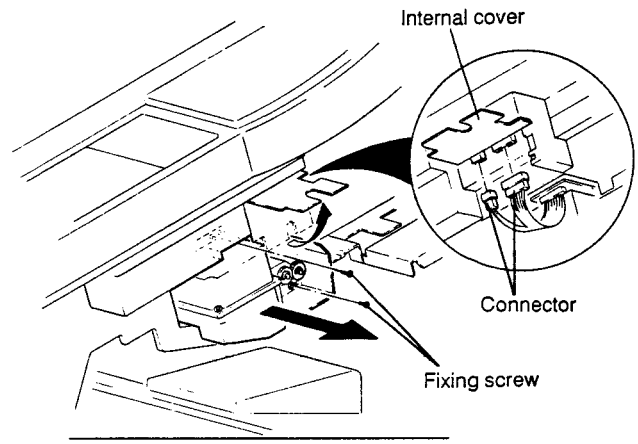
7. Drum peripheral section

A. Drum unit removal

① Open the clamshell, and remove the developer unit.

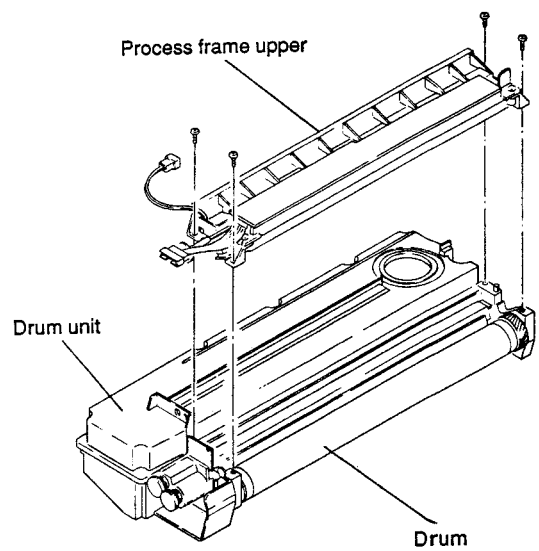
② Open the internal cover, and remove the connectors (2-pin x 1, 7-pin x 1).

③ Remove the drum unit fixing screws (blue screws x 2), and pull out the unit.



B. Separation of the drum unit and the process frame upper

- Remove the screws (2 pcs in the front frame side and 2 pcs. in the rear frame side) which connects the drum unit and the process frame upper.

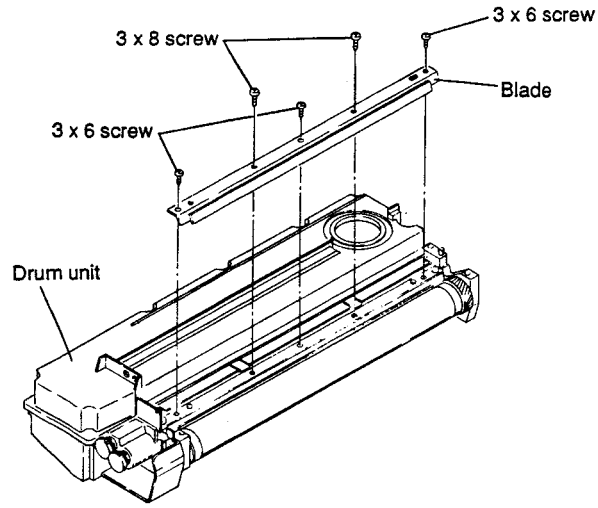


Note: Be careful not to scratch the MC case mylar and the screen grid of the removed process frame.

C. Blade removal

① Remove the process frame upper from the drum unit.

② Remove the screws (2 pcs. of 3 x 8 screws, 3 pcs. of 3 x 6 screws) which are fixing the blade, and remove the blade.

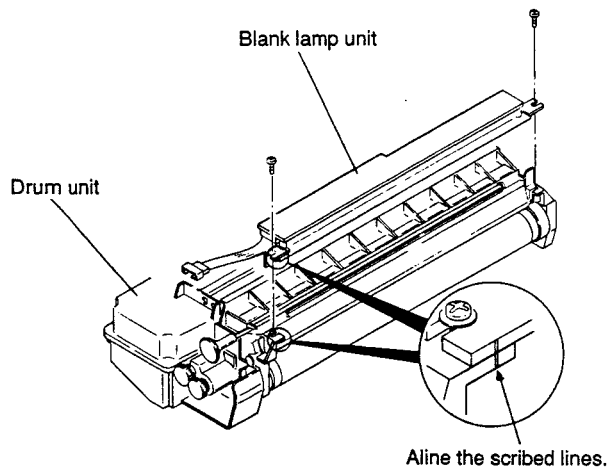


* When installing the blade, Note the screw lengths. After installing, manually turn the drum to make smooth operation of the blade and the drum.

D. Blank lamp removal

- Remove the blank lamp fixing screws (1 in the front side and 1 in the rear side) and remove the blank lamp.

* Note:
  - When removing the blank lamp with the process frame upper removed from the drum unit, be careful not to deform the MC mylar.
  - When installing, align the scribed lines of the blank lamp holder and the drum frame.



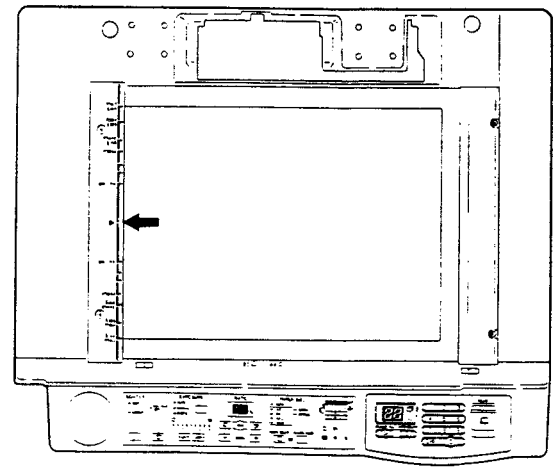
E. Blank lamp adjustment

The blank lamp position adjustment is required in the following cases:

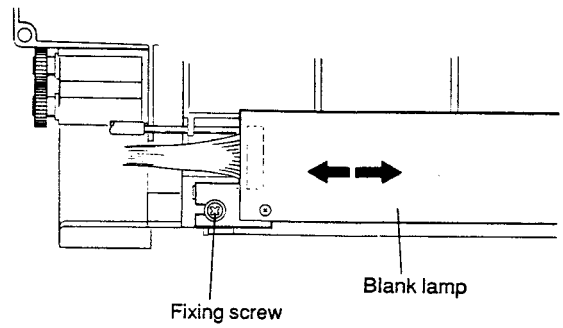
- When the blank lamp unit is replaced.
- When the center deviation is adjusted.
- When the mirror or lens is removed.

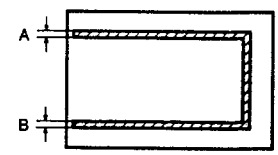
① Check that the center deviation is within 2.0mm. (If the center deviation is more than 2.0mm, perform the center deviation adjustment.)

② Place a white paper of A3 at the center of the document table. Make a copy with A3 paper in the reduction mode (X 0.64) with the original cover open.



③ Measure the sizes of black background in the both sides. Move the blank lamp unit position to adjust so that the width of black background are uniform.

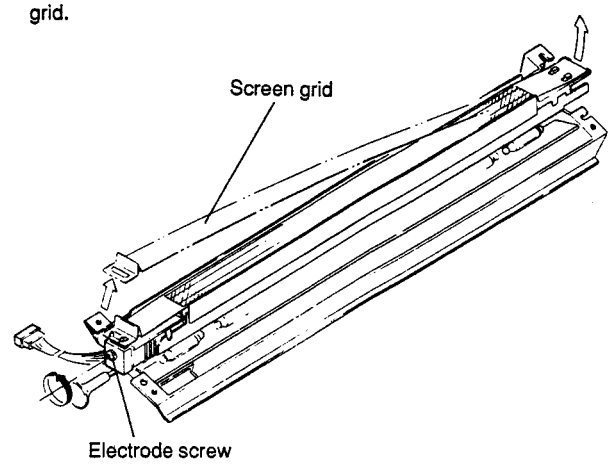




F. MC wire replacement and screen grid replacement (Every 60K copies)

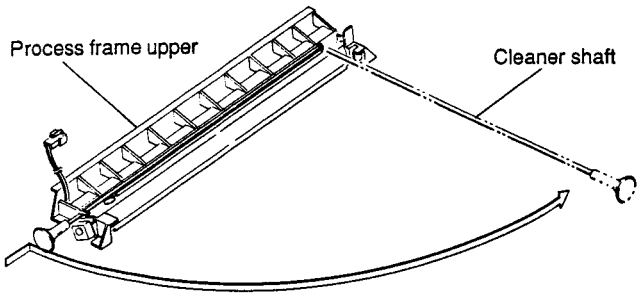
① Remove the drum unit and remove the process frame upper.

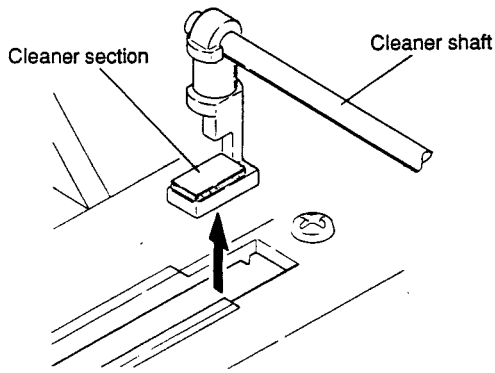
② Loosen the screen grid electrode screw, and remove the screen grid.



③ Remove the blank lamp.

④ With the corona cleaner at the bottom (the rear frame side), turn the cleaner shaft 90 degrees and remove it upward.



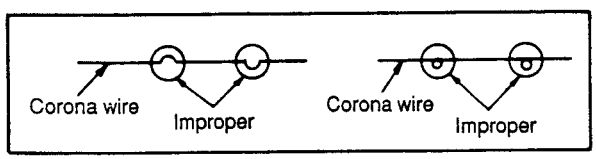


⑤ Loosen the wire fixing screw and remove the wire.

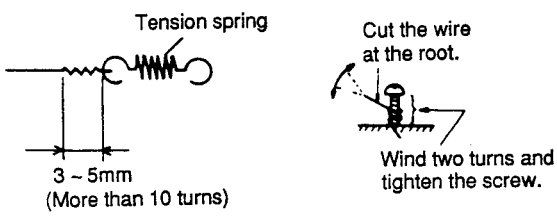
⑥ Set the corona wire.

<<Note for corona wire replacement>>

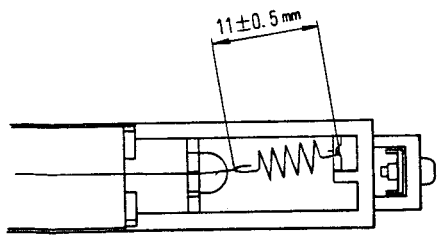
- Be careful not to twist or deform the corona wire.



- Use corona wire of 70u (DWIR-0466CSZZ).



- With the wire installed, check that the tension spring is 11±0.5mm long.

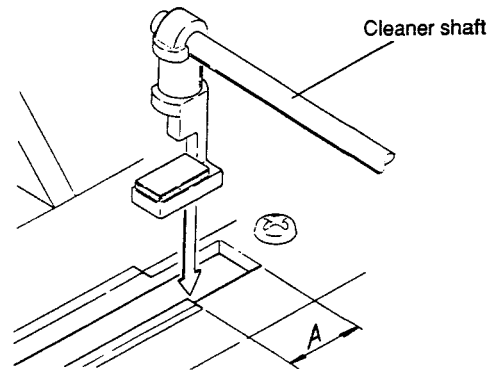


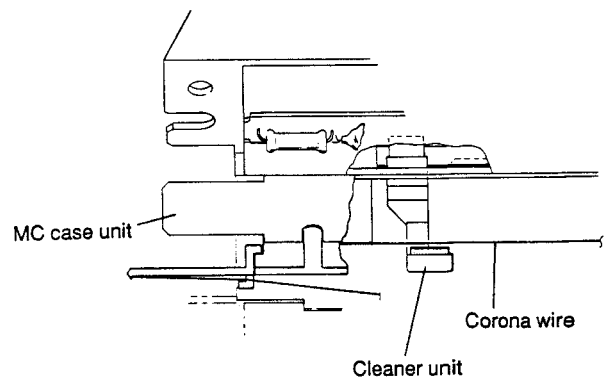
- Do not touch the effective section of the wire. If touched, defective charging may occur.

⑦ Install the corona cleaner by reversing the removing procedure.

<Note for installation>

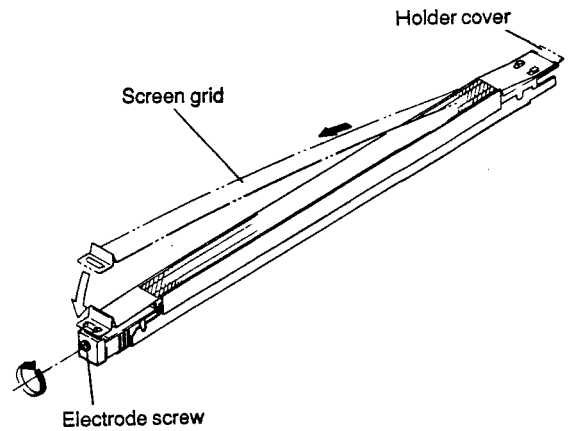
- Attach section A first. (To protect the corona wire.)
- Check that the cleaner section is under the corona wire.





- Check that the corona cleaner moves smoothly.

⑧ Hang the rear frame side of the screen grid on the hook section of the MC holder cover, and hang the other side on the screen grid electrode. Then tighten the electrode screw.



✱ • Do not touch the mesh section of the screen grid.

- Check that the screen grid is free from slack.

⑨ Attach the blank lamp.

8. Drive unit

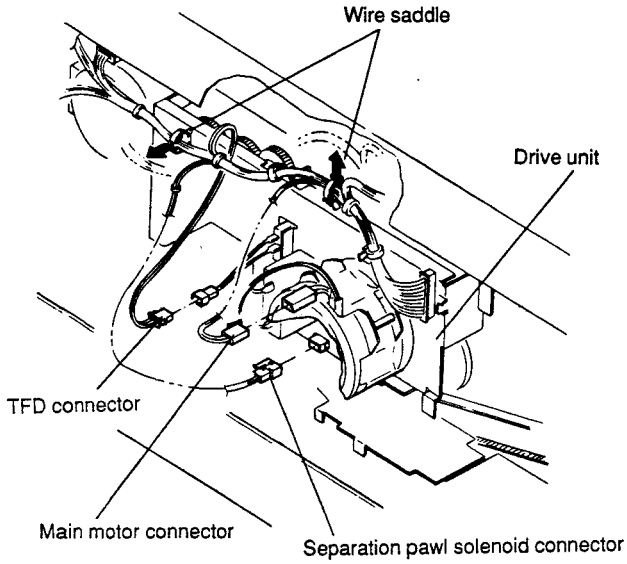
A. Drive unit removal

① Remove the rear cover.

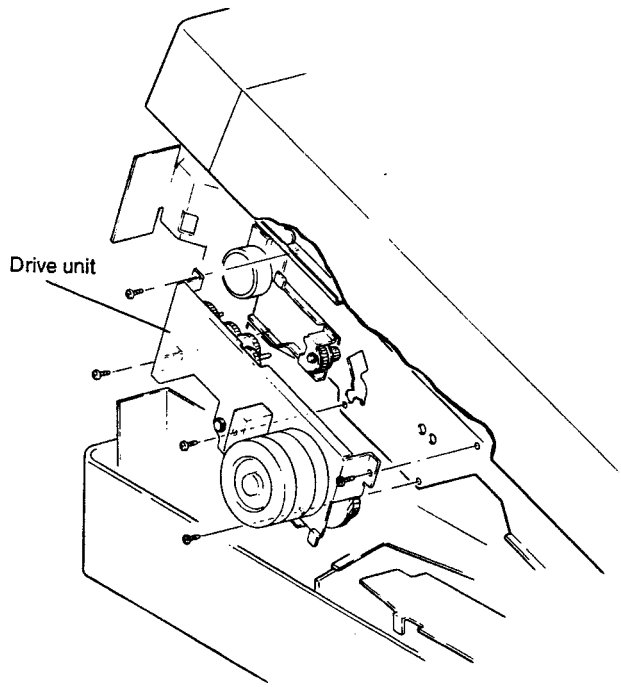
② Remove the main PWB.

③ Remove the high voltage PWB.

④ Remove the main motor connector, the waste toner full detect switch (TFD) connector, and the separation pawl solenoid connector. Remove the harness from the wire saddle. (2 positions)



⑤ Remove the five screws which are fixing the drive unit, and remove the drive unit.



B. Main motor replacement

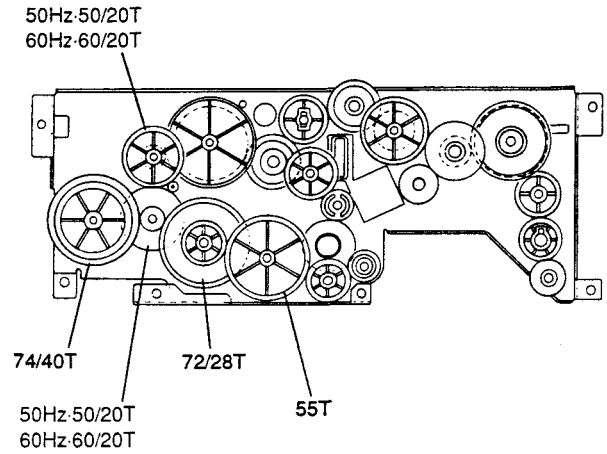
① Remove the drive unit.

② In the case of 60Hz

Remove the 74/40T gear, 55T gear, 72/28T gear, 60/20T gear x 2. (The 60/20T gear is for 60Hz and its color is white.)

In the case of 50Hz

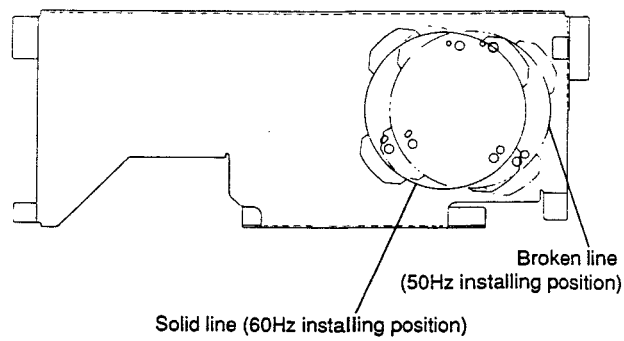
Remove the 74/40T gear, 55T gear, 72/28T gear, 50/20T gear x 2.
(The 50/20T gear is for 50Hz and its color is black.)



③ Remove the three screws which are fixing the main motor, and replace the main motor.

Note: The following items should be noted when installing the main motor.

- The installing position of the main motor differs depending on the frequency (50Hz/60Hz).
  In the case of 60Hz, install the main motor in the left hole (marked with 60) when viewed from the rear frame.
  In the case of 50Hz, install in the right hole.
- Be careful to the installing direction of the gears. (Refer to the above figure.)

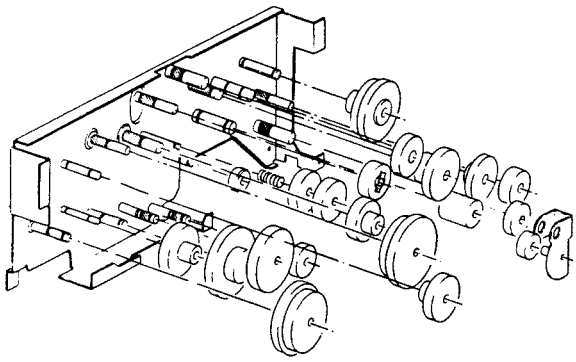


C. Frequency change in the drive unit

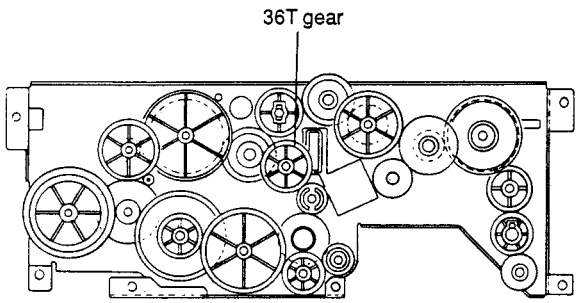
- Main motor: Frequency is 50Hz or 60Hz. (Observe the voltage specification.)
- Gear: Two gears in contact with the motor shaft are different depending on the frequency.
  60Hz --- Gear 60/20T
  50Hz --- Gear 50/20T
- Motor capacitor: Differs depending on the voltage and the frequency. Use the proper one.

D. Note for the drive unit assembly

- When replacing the gears, apply white MOLICOAT (UKOG-0158FCZZ) to the shaded section of the shaft in the figure below:
- Apply white MOLICOAT (UKOG-0158FCZZ) to the main motor output shaft, gears 72/28T, 74/40, 20/35, the ratchet gear, the torque limiter gear.



- Do not apply grease to the 36T gear (for toner full detection).



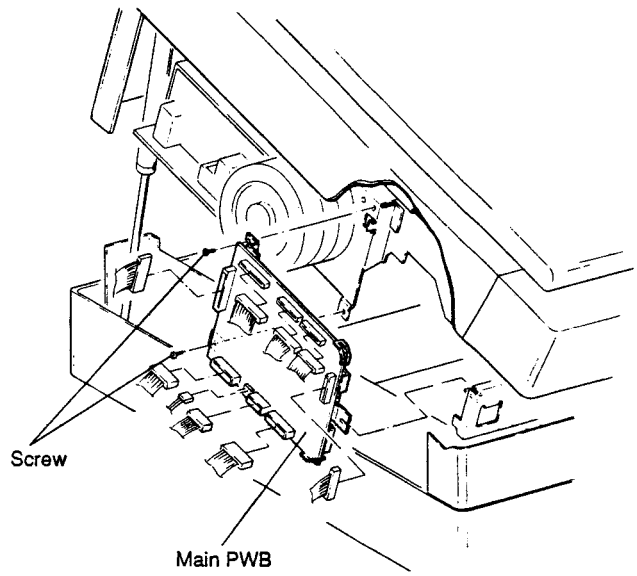
9. PWB replacement and adjustment

A. Main PWB removal

① Remove the rear cover.

② Remove the connectors.

③ Remove the two screws which are fixing the main PWB.



④ Remove the main PWB from the main PWB mounting plate.

B. Adjustments after Replacing the main PWB

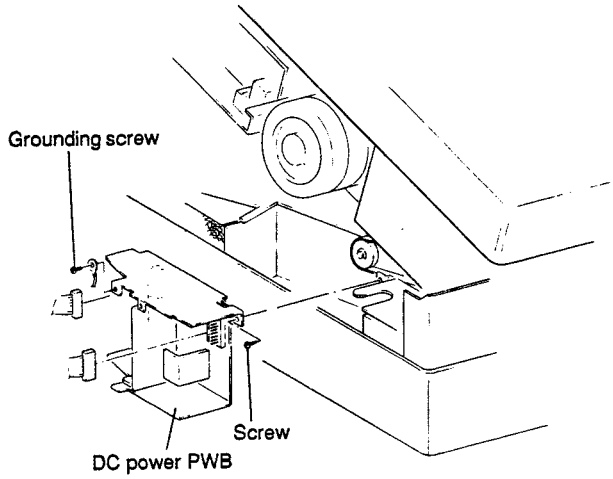
Test command	Function	Ref. page
25	Developer adjustment	10-6
45	Drum sensitivity setting	10-7
46	Copy exposure setting	11-2
47	AE sensor characteristic input	10-7
48	No. 4/5 mirror home position reference value input	10-7
49	Magnification ratio adjustment (feeding direction)	10-8
50	Copy lead edge adjustment	7-20
60	Document detection adjustment	10-8
72	Mini maintenance, copy kit setting	10-9
77	Lens characteristic input	7-16
78	Counter mode setting	10-10
79	Model destination setting	10-10
80	Option setting (When using options)	10-10

C. DC power PWB removal

① Remove the rear cover.

② Remove the grounding screw and remove the PWB mounting screw.

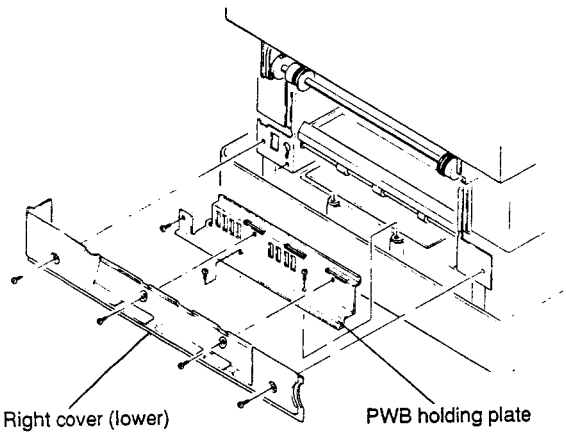
③ Remove the DC power PWB and disconnect the connectors.



D. AC power PWB removal

① Remove the right (lower) cover.

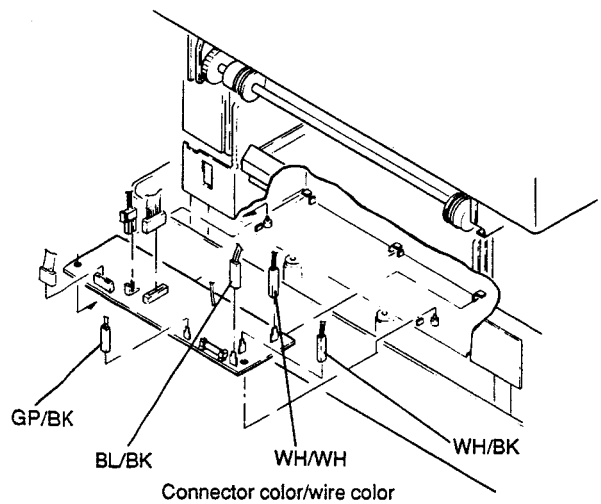
② Remove the PWB holding plate and remove the grounding screw.



③ Remove the AC power PWB and disconnect the connector.

Note for installation

Note the inserting position of the 1-pin connector.

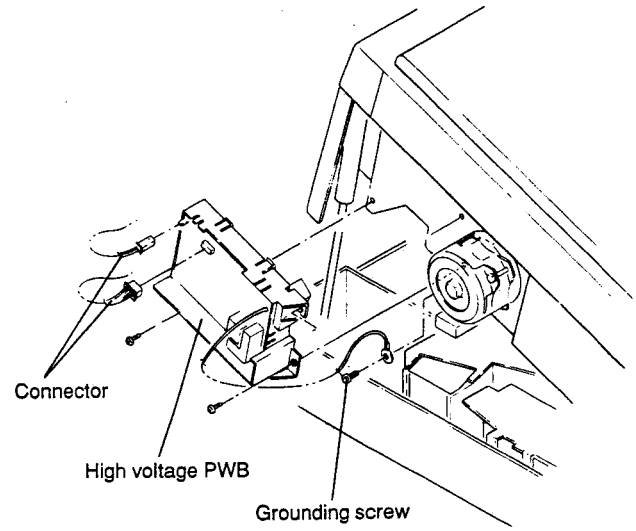


- When attaching the holding plate, carefully arrange the wires.

E. High voltage PWB removal

① Remove the two connectors and remove the grounding screw.

② Remove the three screws which are fixing the PWB, and remove the PWB.



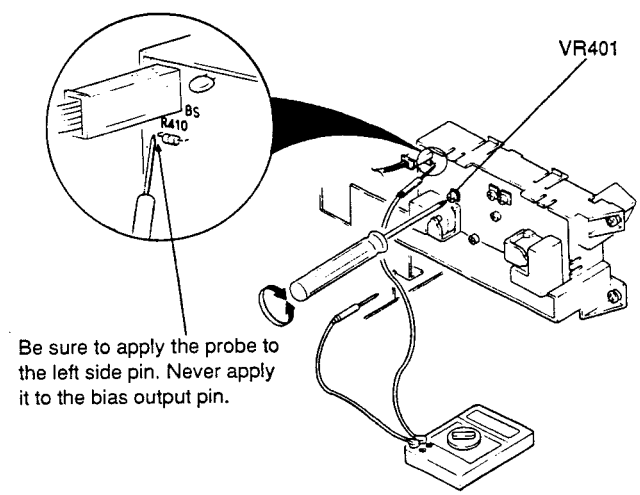
F. DV bias adjustment

① Set the digital multi-meter range to DC300V or more.

② Apply the probe to the left terminal of R410 and the other probe to chassis (GND).

③ Perform test command 8. (The DV bias voltage is supplied for 30 sec.)

④ Adjust the DV bias voltage adjustment VR (VR401) to set the output voltage to –200V ±6V.



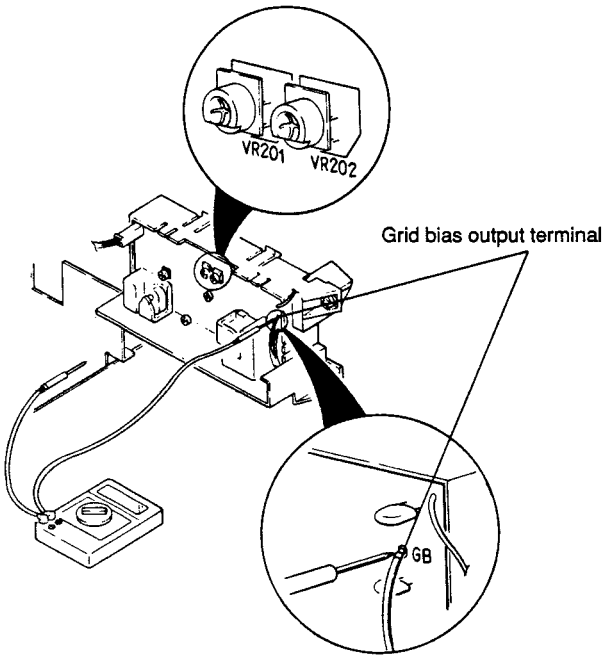
G. Main corona grid bias adjustment

This adjustment is performed in the copy mode.

① Manually turn on the manual paper feed detection switch (PID).

② Perform test command 23 to perform aging without paper.

③ During the test command operation, select between the standard mode and the photo mode with the copy mode select key on the operation panel, and perform adjustment in either mode.



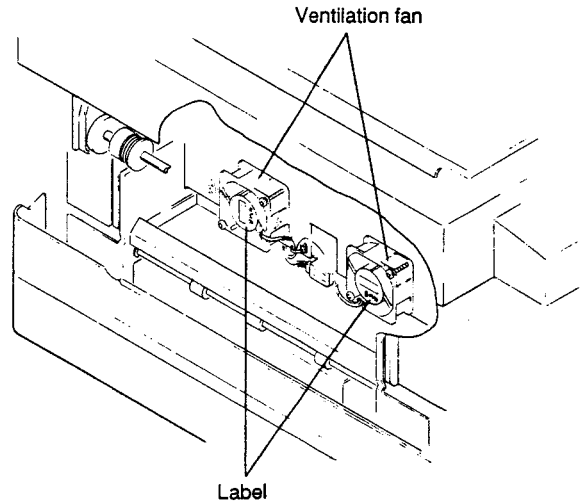
Copy mode	Output voltage	Adjustment VR
Standard	-635±8V	VR201
Photo	See the note below.	VR202

(Note)
For U.S.A, Canada, and United Kingdom, -510 ± 7V.
For the other destinations, -535 ± 7V.

10. Others

A. Note for ventilation fan mounting

Install the ventilation fan so that the label side comes toward you as shown below and arrange the lead wire as shown below. Carefully arrange the lead wire.

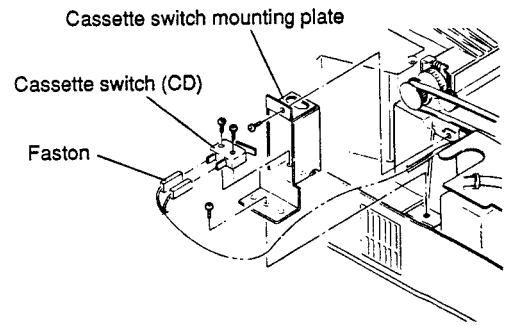


B. Cassette switch (CD-SW) removal

① Remove the DC power unit.

② Remove the cassette switch mounting plate S from the base plate unit. (2 screws)

③ Remove the Faston from the switch and remove the switch from the mounting plate. (2 screws)

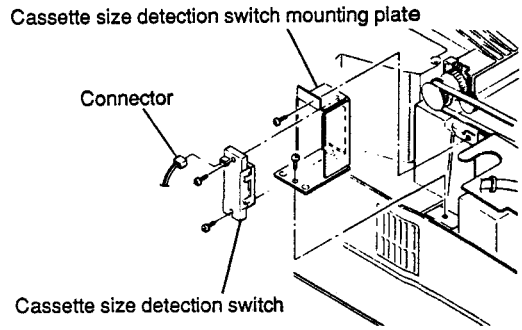


C. Cassette size detection switch (CSD) removal

① Remove the power unit.

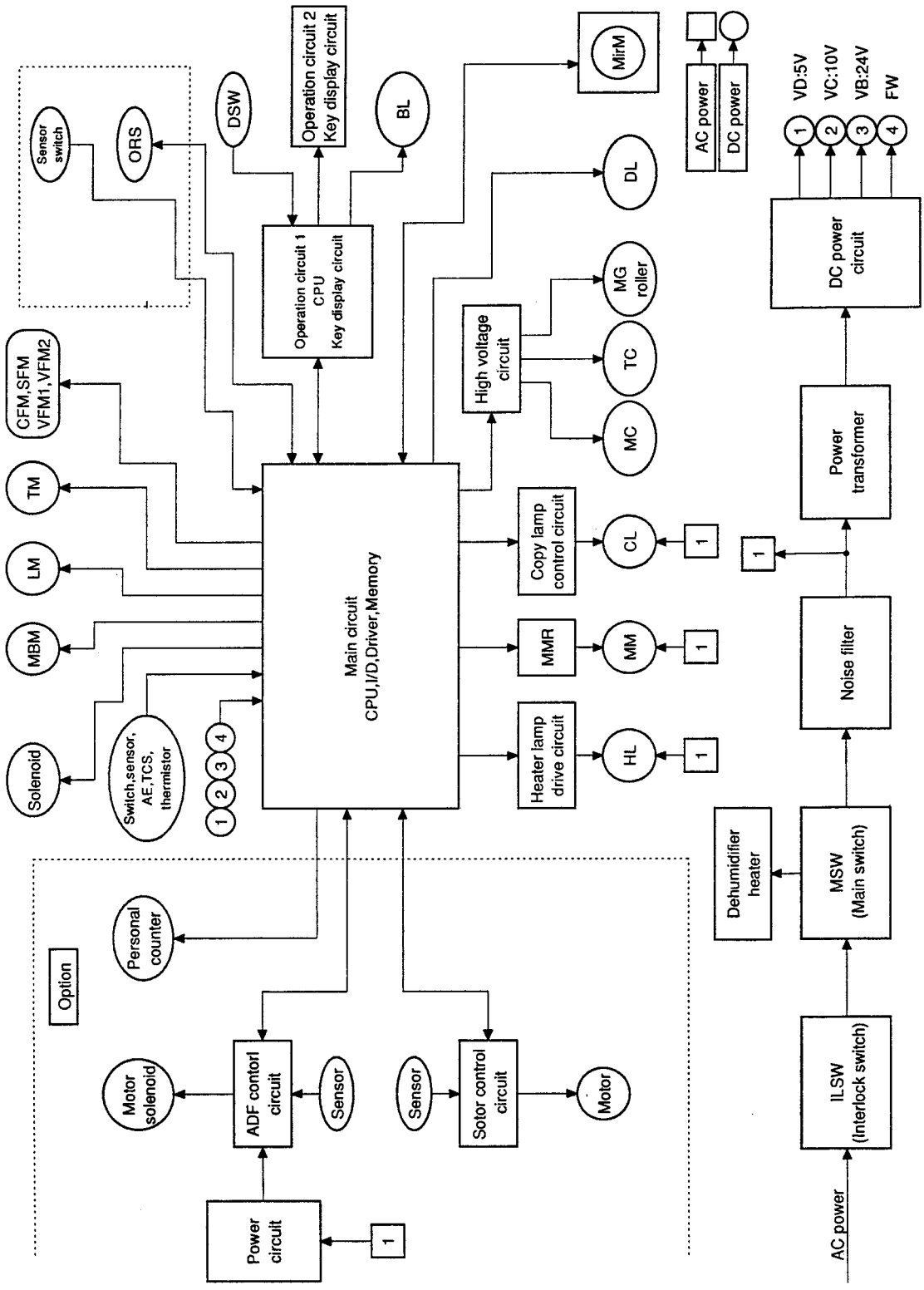
② Remove the cassette size detection mounting plate from the base plate unit. (2 screws)

③ Remove the connector from the switch and remove the switch from the mounting plate.

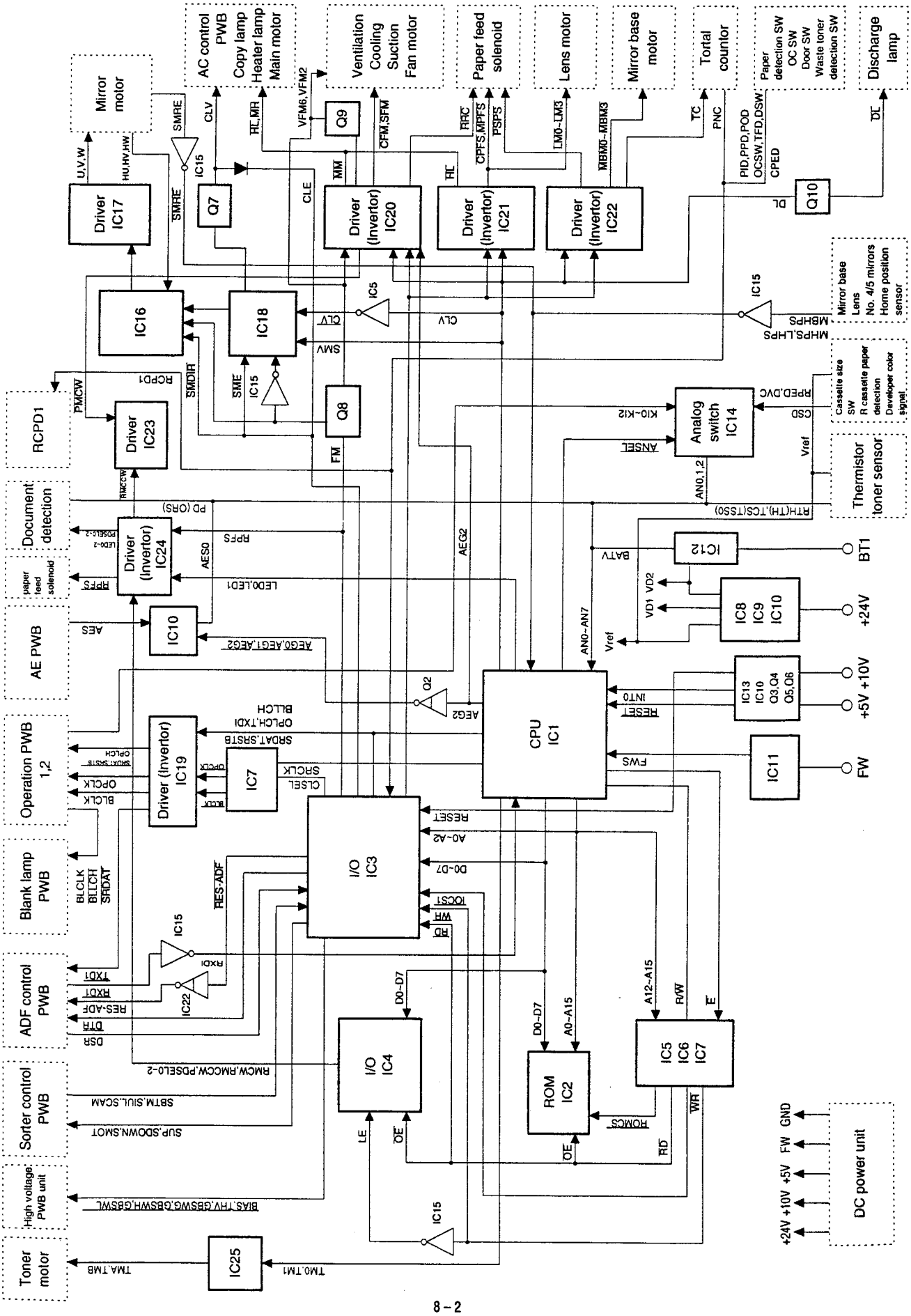


[8] ELECTRICAL SECTION

1. Overall block diagram



2. Main circuit block diagram



3. IC1 (CPU) pin descriptions

Pin No.	In/Out	Signal name	Descriptions
1, 3, 79, 80	IN	AN0, 2, 1	Analog input signal <key input signal (KI0, 1, 2), cassette size detection signal (CSD), rotary cassette paper empty signal (RPED), developer unit color identification signal (DVC)> * See the table below.
2	IN	$\overline{\text{SMRE}}$	Mirror motor rotary encoder detection signal
3	IN	FWS	Power frequency detection signal (AC waveform zero cross timing)
4	OUT	HI	Heater lamp control signal, At HIGH level (+5V), the discharge lamp lights up.
5	OUT	$\overline{\text{ANSEL}}$	Analog switch (IC14) select signal
6	IN	$\overline{\text{MHPS}}$	Mirror base home position detection signal in the optical unit
7	IN	$\overline{\text{INT0}}$	When the power is stabilized, HIGH level (+5V).
8	OUT	DL	Discharge lamp control signal. The discharge lamp lights up at HIGH (+5V) level.
9	OUT	SMV	Mirror motor speed control pulse
10	OUT	TC	Total counter (option) output signal
11	OUT	CLV	Copy lamp light quantity control pulse
12	OUT	RRC	Resist roller control signal. the resist roller stops at HIGH (+5V) level.
13, 14	OUT	LED1, LED0	Document size detection LED lighting signal. LED lights up at HIGh (+5V).
15	OUT	PSPS	Paper separation solenoid control signal. The separation pawl is brought into close contact with the drum at HIGH (+5V) level.
16, 17	OUT	TM1, TM0	Toner motor rotation pulse signal (50Hz)
18	OUT	SRSTB	OP PWB, BI PWB, output driver ON/OFF control signal
19	OUT	OPLCH	Data latch signal to OP PWB
20	OUT	BLLCH	Data latch signal to BL PWB
21	IN	$\overline{\text{MBHPS}}$	No. 4/5 mirror home position detection signal
22	IN	$\overline{\text{LHPS}}$	Lens home position detection signal
23	IN	MM	Main motor control signal. The main motor rotates at HIGH (+5V) level.
24, 25, 26	—	—	Not used.
27	IN	CN, VSS	Processor mode selection
28	IN	$\overline{\text{RESET}}$	When LOW (0V), reset state.
29, 30	IN	XIN, XOUT	Clock (8MHz)
31	OUT	$\overline{\text{E}}$	When LOW (0V), data or command code read and data write are performed.
32	—	VSS	GND (0V)
33, 34, 35	—	—	Not used.
36	OUT	R/W	ROM/RAM data read, RAM I/O data write signal
37 ~ 44	IN/OUT	D7 ~ D0	Data signal
45 ~ 60	OUT	A15 ~ A0	Address signal
61	OUT	TXD1	Serial data output to slave CPU (ADE)
62	IN	RXD1	Serial data input from slave CPU (ADE)
63	OUT	AEG2	AE sensor gain lamp select signal
64	—	—	Not used.
65	OUT	SRDAT	Serial data output to OP PWB, BL PWB.
66	—	RXD0	Not used.
67	—	SRCLK	Data transfer clock signal to OP PWB and BL PWB
68	—	—	Not used.
69,70	—	VCC, AVCC	Power (+5V)
71	IN	Vref	Analog/digital conversion reference voltage (About +5V)
72,73	—	AVss, Vss	GND (0V)
74	IN	BATV	Analog input signal (Battery voltage)
75	IN	ORS	Analog input signal (Document detection data)
76	IN	TH	Analog input signal (Thermistor)
77	IN	TSS0	Analog input signal (Toner control sensor output)
78	IN	AES0	Analog input signal (AE sensor output)

*

$\overline{\text{ANSEL}}$	L (0V)	H (+5V)
AN0	KI0 (Key input signal)	CSD (Cassette size detection signal)
AN1	KI1 (Key input signal)	RPED (Rotary cassette paper empty signal
AN2	KI2 (Key input signal)	DVC (Developer color identification signal)

4. IC3 (I/O) pin descriptions

Pin No.	IN/OUT	Signal name	Descriptions
1	OUT	SDOWN	Sorter bin motor control signal. The bin moves down at HIGh (+5V).
2	OUT	SUP	Sorter bin motor control signal. The bin moves upward at LOW (0V).
3	—	VCC	Power (+5V)
4	OUT	$\overline{\text{DTR}}$	Data are sent to ADF CPU at HIGH (+5V), data are received at LOW (0V).
5	OUT	$\overline{\text{GBSWL}}$	Grid bias high voltage output (in the photo mode) control signal
6	OUT	$\overline{\text{GBSWH}}$	Grid bias high voltage output (in the normal mode) control signal
7	OUT	$\overline{\text{GBSWG}}$	Grid bias high voltage output (in the void form mode) control signal
8	OUT	$\overline{\text{THV}}$	Transfer corona high voltage output control signal. Output at LOW (0V).
9	OUT	$\overline{\text{BIAS}}$	Developer bias high voltage output control signal. Output at LOW (0V).
10	OUT	SLSEL	OP PWB output clock/BL PWB output clock select signal
11	OUT	$\overline{\text{FM}}$	Cooling fan motor, suction fan motor control signal. Rotates at LOW (0V).
12	—	GND3	GND (0V)
13 ~ 16	OUT	MRM0 ~ MRM3	No. 4/5 mirror motor control signal
17 ~ 20	OUT	LM0 ~ LM3	Lens motor control signal
21	IN	PID	Manual feed and multi-feeder paper empty detect signal
22	IN	PPD	Paper entry detect signal
23	IN	POD	Paper exit detect signal
24	IN	TED	Waste toner full detect signal
25	IN	PNC	Personal counter installation detect signal
26	IN	UC	U2 cancel detect signal
27	IN	OCSW	Original cover open/close detect signal
28	IN	DSW	Front door open/close detect signal
29	—	VCC	Power (+5V)
30	IN	RD	Reads data at each port at LOW (0V).
31	IN	WR	Write data into each port and each control word resistor at LOW (0V).
32	IN	$\overline{\text{IOCS1}}$	Chip select signal
33	IN	RESET	Reset at HIGH (+5V).
34	—	GND1	GND (0V)
35, 36, 37	IN	A2, A1, A0	Address signal
38 ~ 45	IN	D0 ~ D7	Data signal
46	OUT	$\overline{\text{RES-ADF}}$	ADF CPU reset signal
47	OUT	RPFS	Lower cassette paper feed solenoid control signal. The lower cassette paper feed roller rotates at HIGH (+5V).
48	OUT	CPFS	Upper cassette paper feed solenoid control signal. The upper cassette paper feed roller rotates at HIGH (+5V).
49	OUT	MPFS	Multi-feeder paper feed solenoid control signal. The multi-feeder paper feed roller rotates at HIGH (+5V).
50	IN	S-80	Test command No. 80 entry allowable detect signal.
51	IN	RCPD2	Not used
52	IN	CPED	250-sheet cassette paper empty detect signal
53	IN	RCPD1	Lower cassette sensor 1 sense signal
54	IN	DSR	Data request signal from ADF
55	IN	SCAM	Sorter position sense signal
56	IN	SINL	Sorter door open signal
57	IN	SBTM	Sorter door home position sense signal
58	—	GND2	GND (0V)
59	OUT	AEG0	AE sensor gain lamp select signal
60	OUT	AEG1	AE sensor gain lamp select signal
61	OUT	CLE	Copy lamp lighting allow signal
62	OUT	SME	Mirror motor operation allow signal
63	OUT	$\overline{\text{SMDIR}}$	Mirror motor feed/return select signal
64	OUT	SMOT	Sorter transport motor ON signal

[9] MAINTENANCE

1. Maintenance cycle and check items

The maintenance of the SF-7855/7830 should be performed every 60K copies.
★ = Lubrication
○ = Cleaning
Δ = Adjustment
▲ = Replacement/Installation
× = Check (Clean, replace, or adjust as required.)

Section	Part name	Maintenance frequency					
		Installation	Service call	30K	60K	90K	120K
Developer unit	Developer	▲		▲	▲	▲	▲
	DV blade						▲
	Side seals (F, R)						▲
Drum section	Drum unit			▲	▲	▲	▲
	MC wire		○(×)	○	▲	○	▲
	MC case		○	○	○	○	○
	Screen grid		○(×)	○	▲	○	▲
	TC wire		○(×)	○	▲	○	▲
	TC case		○	○	○	○	○
	Discharge plate		○(×)	○	▲	○	▲
	Blank lamp (BL)		○	○	○	○	○
	Discharge lamp (DL)		○	○	○	○	○
Suction unit	Suction belt		○(×)	○	○	○	○
	Ozone filter						▲
Fuser unit	Upper heat roller ass'y (including bearings and gears.)		○	○	▲	○	▲
	Lower heat roller		○	○	▲	○	▲
	Upper separation pawl		○	○	▲	○	▲
	Lower separation pawl		○(×)	○	○	○	○
	Lower cleaning roller				▲		▲
	Upper cleaning rolelr				▲		▲
	Thermistor		○	○	○	○	○
Optical system	Mirror/Lens/Reflector/Filter		○	○	○	○	○
	No. 2/3 mirror drive wire/Winding pulley			×	×	×	×
	Lens, No. 4/5 mirror drive wire			×	×	×	×
	No. 4/5 mirror home position sensor		○	○	○	○	○
	Lens home position sensor		○	○	○	○	○
	Lamp unit home position sensor		○	○	○	○	○
	AE sensor		○	○	○	○	○
	Mirror base rail			★	★	★	★
Paper feed unit	Paper feed roller (each cassette)			○	○	○	○
	Resistor rollers (upper and lower)			○	○	○	○
	Transport roller, transport follower roller			○	○	○	○
	Spring clutches			★	★	★	★
Copy quality			×	×	×	×	×
Others	Ozone filter (paper entry section)						▲
	Paper guide		○(×)	○	○	○	○
	Table glass/Original guide)		○	○	○	○	○
	Gears			★	★	★	★

2. Maintenance procedure

A. Developer unit

a. Developer replacement (every 30K)
Refer to the following sections:
[3] UNPACKING AND INSTALLATION 3. Installation
5) Developer unit setting
6) Toner concentration sensor level adjustment

b. DV blade replacement (every 120K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
4. Developer unit
B. DV blade replacement

c. Side seals F and R replacement (every 120K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
4. Developer unit
A. DV side seals F and R replacement

B. Drum section

a. Drum cartridge replacement (every 30K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
7. Drum section
A. Drum unit removal
B. Separation of the drum unit and the process frame upper

b. MC wire replacement (every 60K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
7. Drum section
F. MC wire replacement and screen grid replacement

c. Screen grid replacement (every 60K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
7. Drum section
F. MC wire replacement and screen grid replacement

d. TC wire replacement (every 60K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
2. High voltage section
C. TC wire replacement

e. Discharge plate cleaning and replacement (Clean every 30K and replace every 60K.)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
5. Suction unit
B. Discharge plate replacement

C. Suction unit

Ozone filter replacement (every 120K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
5. Suction unit
A. Ozone filter replacement

D. Fuser unit

a. Upper heat roller ass'y cleaning and replacement (Clean every 30K and replace every 60K.)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
6. Fuser unit
C. Upper heat roller ass'y replacement

b. Lower heat roller ass'y cleaning and replacement (Clean every 30K and replace every 60K.)
Refer to the following section:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
6. Fuser unit
E. Lower heat roller replacement

c. Upper separation pawl cleaning and replacement (Clean every 30K and replace every 60K.)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
6. Fuser unit
D. Upper separation pawl replacement

d. Lower cleaning roller (Every 60K)
Refer to the following sections:
[7] DISASSEMBLY, ASSEMBLY, AND ADJUSTMENT
6. Fuser unit

e. Upper cleaning roller (Every 60K)

E. Optical system

a. No. 1 ~ No. 5 mirrors and lens cleaning

① Remove the table glass and the dark box cover.

② Softly wipe the mirrors and lens with clean cloth.

* When attaching the table glass, be careful to the direction.

b. Dust-prevention filter cleaning
After former procedure a, slide the mirror base C (No. 4/5 mirrors) to the paper feed side.

c. No. 6 mirror cleaning
Remove the developer unit and softly wipe inside with clean cloth.

F. Copy quality

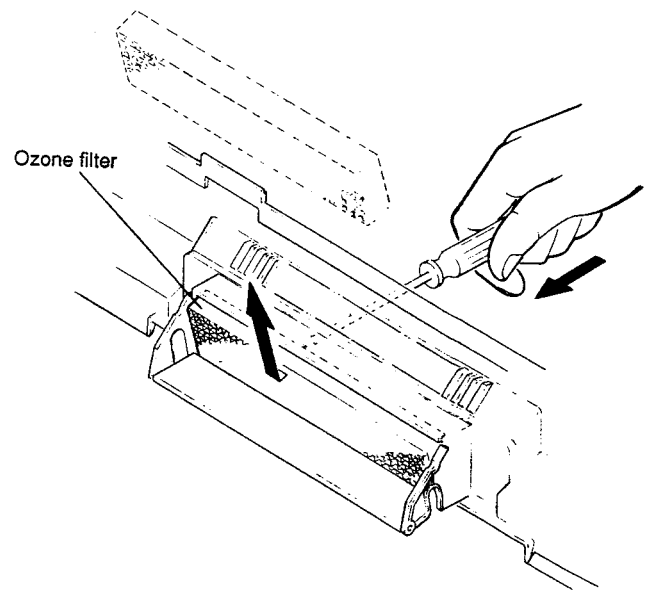
Refer to the following section:
[3] UNPACKING AND INSTALLATION 3. Installation
12)Copy check

G. Others

Ozone filter paper exit section (every 120K)

① Remove the left cover. (2 screws)

② Insert a screwdriver through the slit in the cabinet to push out the filter.



③ Attach a new filter.

[10] TEST FUNCTIONS AND SELF-DIAGNOSIS

1. Test functions

(1) General

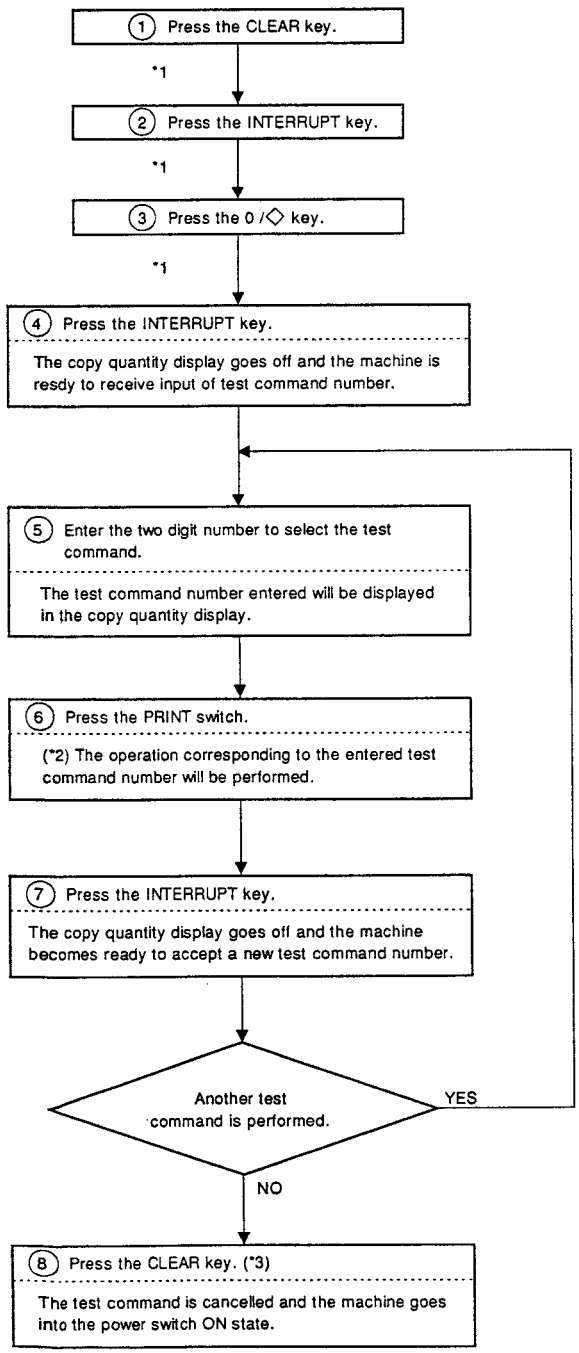
The test functions allow the following operations:

- To drive each section independently to check the operation of the section.
- To perform adjustments.
- To cancel a trouble status.
- To set specific functions and options.

(2) Purpose

The test functions are used to help servicing, repairing, and adjusting.

(3) Test command operation


1 Press the CLEAR key.
*1
2 Press the INTERRUPT key.
*1
3 Press the 0 /◇ key.
*1
4 Press the INTERRUPT key.
The copy quantity display goes off and the machine is resdy to receive input of test command number.
5 Enter the two digit number to select the test command.
The test command number entered will be displayed in the copy quantity display.
6 Press the PRINT switch.
(*2) The operation corresponding to the entered test command number will be performed.
7 Press the INTERRUPT key.
The copy quantity display goes off and the machine becomes ready to accept a new test command number.
Another test command is performed.
YES
NO
8 Press the CLEAR key. (*3)
The test command is cancelled and the machine goes into the power switch ON state.

When the INTERRUPT key is pressed in the middle of executing a test command, the operation stops and the number in the multi-copy window goes out. With this, the copier becomes ready to accept a new test command number.

*1: Unless the next key entry is performed within 5 sec, it won't be accepted.

*2: Depending on the test command number, additional entries may be required.

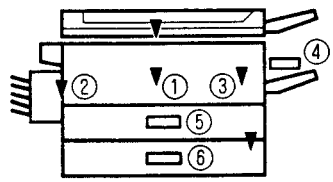
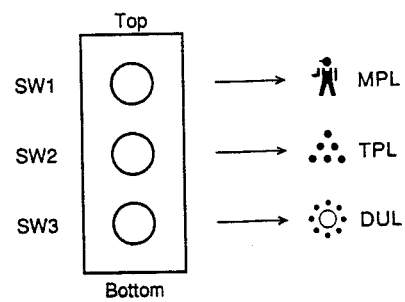
*3: Since a different method is required to cancel the test command depending on the test command, the following operation must be done. After the test command is cancelled, the machine starts from the state as when the power is just turned on.

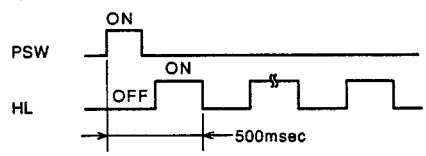
- To cancel any test command other than 21, 22, 23, and 24:
  Press the CLEAR key twice.
- To cancel test command 21, 22, 23, or 24, perform one of the following operation.
  1. Turn off/on the power switch.
  2. Press the CLEAR key, the INTERRUPT key, 0 key, the INTERRUPT key, and the CLEAR key in this sequence.
- For test command 13 and 14:
  Since test commands 13 and 14 are used to clear the contents of the diagnostic status (U1, H3, H4) stored in the LSI, the diagnostic mode will be automatically cancelled after completion of the test command.

(4) List of the test commands

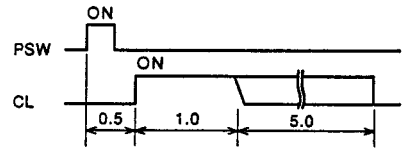
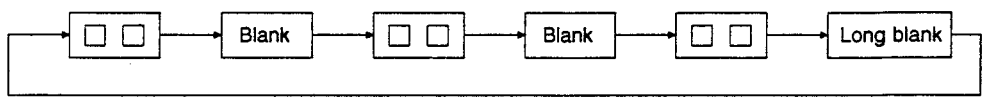
No.	Function
1	Optical system mirror test
2	Optical system sensor test
3	Paper sensor test
4	Cassette size switch test
5	Display system test, 5 sec ON
6	Fusing heater lamp test, Heater lamp 5 times of ON/OFF
7	Copy lamp test, Full power for 1 sec, ME for 5 sec.
8	Bias output test
9	Main corona output, grid bias test
10	Transfer corona output test
11	Separation corona output test
12	Blank lamp, discharge lamp test
13	U1 trouble cancel
14	Trouble cancel for other than U1 and U2, Toner full detection cancel
15	Jam map, jam total counter clear
16	Maintenance preset counter display
17	Jam map display, jam total counter display
18	Total count display
19	Maintenance count display
20	Maintenance counter clear
21	Warm up time display, aging with jam detection
22	Warm up time display, aging without jam detection
23	Aging without fusing and jam detection
24	Warm-up omission
25	Automatic developer adjustment, rotary parts test
26	Lens operation test
27	Lens cycling
30	ADF sensor state display
31	ADF aging
33	ADF individual load test
34	Separation pawl test, 20 times of ON/OFF
40	Developer preset counter display
41	Developer count display
42	Developer counter clear
45	Drum sensitivity setting
46	Exposure level adjustment
47	AE sensor characteristics test, gain setting
48	Front/rear direction magnification ratio adjustment
49	Paper transport direction, magnification ratio adjustment
50	Lead edge image position adjustment
58	Lead edge image position adjustment
60	Document size sensor test/adjustment
61	Sorter load individual operation test, sensor test
70	ADF count display
72	Maintenance preset counter setting
77	Lens, mirror base focus setting
78	Counter mode setting
79	Destination setting
80	Option setting
92	Lower cassette paper sensor display
94	Document sensor display
96	Fusing temperature setting
98	Lower cassette paper sensor test/adjustment

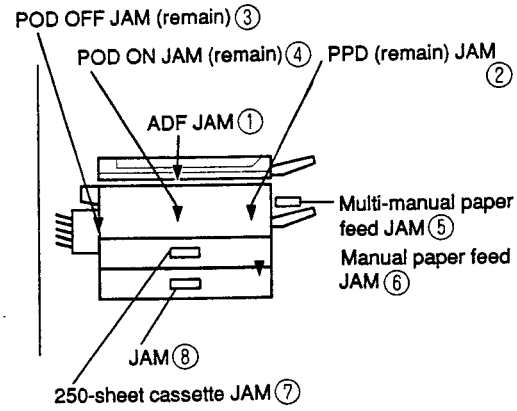
(5) Details of the test functions

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td>1</td><td>Optical system diagnostic program. The mirror base automatically scans.
(1) With the depression of the PRINT switch, it changes from the test command mode to execution wait mode with the ready pilot lamp (RPL) active and the magnification ratio at 100%. The magnification ratio may be changed using the magnification ratio select key.
(2) When the PRINT switch is pressed while RPL is active, the lamp goes out and the test command starts executing. The mirror base scans according to the magnification ratio set at that time.</td></tr>
<tr><td>2</td><td>Optical sensor test command. When this test command is executed, the on/off state of optical sensors can be tested with the following lamps:
① MPL (maintenance lamp): Mirror rotary encoder pulse (RE) input
② IPL (jam lamp): Mirror home position sensor (MHPS)
③ DVL (Developer maintenance lamp): Lens home position sensor (LHPS)
④ TPL (Toner empty lamp): No. 4/5 mirror base home position sensor (MBHPS)</td></tr>
<tr><td>3</td><td>Paper sensor test command. The on and off state of three sensors can be tested using the misfeed location indicators. It also enables the testing of the cassette paper empty sensors (including manual feed) and sorter paper empty sensor.
① J3L (paper entry jam): PPD (Paper pass detector)
② J2L (Paper exit jam): POD (Paper-out detector
③ J4L (Manual paper feed jam): PID (Manual paper-in detector)
④ MFL (Multi-manual paper feed jam): PID (Multi-manual paper-in detector)
* Only when the SF-MF12 is installed.
⑤ CSL1 (250CS jam): CPED (cassette paper empty detector)
⑥ CSL2 (Lower cassette jam): RPED (Rotary cassette paper empty detector)
 
</td></tr>
<tr><td>4</td><td>Paper size and lower cassette detection switch test command. See the table below for the relation of the switch to be tested vs. indicator.
<table><tr><th>SW-1 (Upper)</th><th>SW-2 (Center)</th><th>SW-3 (Lower)</th><th>Inch series</th><th>AB series</th></tr><tr><td>ON</td><td>OFF</td><td>OFF</td><td>11" x 17" (W letter)</td><td>B5</td></tr><tr><td>ON</td><td>OFF</td><td>ON</td><td>8½" x 11" (Letter)</td><td>B5R</td></tr><tr><td>OFF</td><td>ON</td><td>ON</td><td>8½" x 14" (Legal)</td><td>A4</td></tr><tr><td>ON</td><td>ON</td><td>OFF</td><td>8½" x 11" (Letter R)</td><td>A4R</td></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>EXTRA</td><td>B4</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>EXTRA</td><td>A3</td></tr><tr><td>ON</td><td>ON</td><td>ON</td><td>EXTRA</td><td>EXTRA</td></tr></table> 

Paper empty lamp is "ON" when lower cassette is at ready position.</td></tr>
<tr><td>5</td><td>All the LEDs on the operation panel are activated for 5 sec.</td></tr>
<tr><td>6</td><td>Heater lamp test command. This turns the heater lamp on and off 5 times.
 

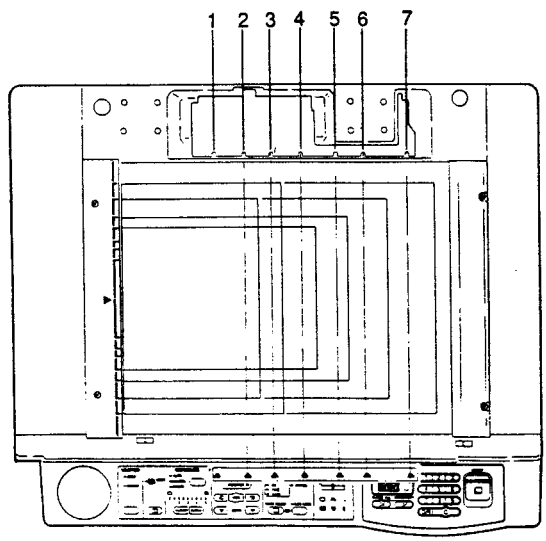
In the order shown above, the heater is turned on and off 5 times.</td></tr>
</table>

Test command	Function
7	Copy lamp test command. The copy lamp is turned on in the following sequence.  When this test command is executed, manual exposure "3.0" is displayed. After full power ON for 1 sec, the exposure is made according to the exposure key setting. * This test command must not be executed continuously.
8	Developing bias test command. The bias voltage is supplied for 30 sec.
9	Main corona front/rear balance test. ON for 30 sec. During execution of this test command, the grid bias can be changed with numeric key entry. 0: High 1: Low 2: GND
10	Transfer corona (THV) output test command. The transfer corona is activated for 30 sec. When the test command number is entered and the CA (Clear All) key is pressed, the PAL (INTERRUPT lamp) lights up. When the PSW (Print switch) is pressed after that, the transfer corona (THV) and separation corona (SHV) are turned on for 30 sec.
11	Separation corona (SHV) output test. ON for 30 sec.
12	Discharge lamp (DL) and blank lamp (BL) test command. • The discharge lamp turns on for 30 sec. • The blank lamps light up one by one from the front frame side to the rear frame side. (All the blank lamps light up at the end.)
13	U1 trouble cancel. After cancellation of U1 trouble, the test command is also cancelled automatically.
14	Used to cancel troubles other than U1 and U2. After cancellation of trouble, the test command is also cancelled automatically. Also used to cancel toner full detection (the maintenance lamp blinking).
15	Jam map, jam total counter clear test command. Differing from the other test commands, this test command is cleared by pressing the CA key and then the PSW. This is to prevent erroneous cancellation. C → =J → 0 → =J → 1 → 5 → CA → PSW
16	Used to check the contents of the maintenance preset counter. The contents are displayed in three divisions of two digits at a time in the copy quantity display. 
17	Used for jam map display and jam total counter display. Jam memory: When a jam trouble occurs, the jam is stored in memory and the total counter counts up by one. However, jams occurred when the power is turned on or when in the initial jam check from resctting test command, are not counted. Jam and remedy ① ADF jam: Common to document/paper jam ② PPD remain jam ③ POD not-reaching jam ④ POD remain jam ⑤ Multi-manual paper feed jam ⑥ Manual spare paper jam: Including manual paper feed in multi-copy. ⑦ Upper cassette paper feed jam ⑧ Lower cassette paper feed jam

Test command	Function
	 ° Jam map display [C] → [=J] → [O] → [=J] → [1] → [7] → [PSW] In this mode, the jam map index is displayed in the multi display, and the LED lights up to indicate the jam location. The latest jam is displayed at first. With the ZOOM UP/DOWN key, the jam map can be checked in sequence. <ZOOM-UP> Index display: 50 → 1 → 2 → 48 → 49 <ZOOM-DOWN> Index display: 50 → 49 → 48 → 2 → 1 When the total jam count is 0, the index display is 0 and the ZOOM-UP/ ZOOM-DOWN keys are not effective. When the total index is at the maximum, and the display is changed with the ZOOM-UP key and the ZOOM-DOWN key. ° Jam total counter display [C] → [=J] → [O] → [=J] → [1] → [7] → [CA] → [PSW] With the above key operation, the INTERRUPT lamp lights up the total number of jam is displayed in the numeric entry section.
18	Used to check the machine total counter copy number. Displayed in the same manner as test command 16.
19	Displays the copy quantity in the maintenance counter in the same manner as test command 16.
20	Used to reset the contents of the maintenance counter to zero after completion of machine maintenance. This test command should be executed after the completion of machine maintenance.
21	1. Used to check the warm-up time 2. Used to repeat the aging test according to the selected copy quantity. When this test command is executed, the machine goes into the ordinary operating mode, and the warm-up time is displayed in seconds in the copy quantity display. When RPL turns on, warm-up counting stops and the display remains as it is. Depression of the CLEAR key, entry of a copy quantity, and pressing the PRINT switch begins the aging operation until the entered copy quantity is reached. The paper misfeed detect function stays active.
22	The aging test carried out without using paper. As it is almost identical to the test command 21, the aging test can be performed, disabling the misfeed detect function. The warmup time is displayed similarly to test command 21.
23	Almost identical to the test command 22, the warmup time display is omitted, the heater trouble detect function and paper misfeed detect function are disabled. (The heater lamp does not turn on.)
24	Permits machine operational check by omitting the warmup time. RPL lights up immediately after the execution of the test command. It is possible to immediately proceed to check machine operation. However, the trouble status "H4" may be displayed as the low heater temperature may be detected if the heater temperature is low.

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td>25</td><td>
Test command 25 has two modes:
① Drive section test, toner sensor test and toner full detection test mode.
② Automatic developer adjustment mode
① [C] → [=J] → [0/◊] → [=J] → [2] → [5] → [PSW]
Operations similar to the conventional test command 25 operation is performed. (3 min). At that time, ON/OFF of the toner full detector can be checked with the color toner lamp.
During execution of this test command, the toner sensor output is displayed in the copy quantity display as below:
<table>
<tr><th>Copy quantity display</th><th>Toner concentration sensor value</th></tr>
<tr><td>EL</td><td>1.5V max.</td></tr>
<tr><td>0</td><td>1.5V</td></tr>
<tr><td>↕</td><td>↕</td></tr>
<tr><td>50</td><td>2.5V</td></tr>
<tr><td>↕</td><td>↕</td></tr>
<tr><td>99</td><td>3.5V</td></tr>
<tr><td>EU</td><td>3.5V min.</td></tr>
</table>
* When the sensor value changes by about 0.02V the display changes by 1.
Toner lamp ON: Sensor input value > Proper concentration (Under toned)
Toner lamp OFF: Sensor input value ≤ Proper concentration (Over toned)
The above is displayed and the developer color can be checked with the following lamp display.
<table>
<tr><th>Color</th><th>Maintenance lamp</th><th>Jam lamp</th><th>Developer lamp</th></tr>
<tr><td>Black</td><td>ON</td><td>—</td><td>—</td></tr>
<tr><td>Red</td><td>—</td><td>ON</td><td>—</td></tr>
<tr><td>Blue</td><td>ON</td><td>ON</td><td>—</td></tr>
<tr><td>Brown</td><td>—</td><td>—</td><td>ON</td></tr>
<tr><td>Green</td><td>ON</td><td>—</td><td>ON</td></tr>
<tr><td>(Spare)</td><td>—</td><td>ON</td><td>ON</td></tr>
</table>
② [C] → [=J] → [0/◊] → [=J] → [2] → [5] → [CA] → [PSW]
└→ The interruption lamp lights up.
With the above key operation, automatic developer adjustment is executed in the following process.
i) The developer is stirred (2min for the black developer, 3 min for the other developers). During stirring, the toner concentration sensor value is displayed in the copy quantity display.
ii) After 2 min (3 min in the case of color developer), the toner concentration sensor value is read 16 times (at every 0.3 sec) and the average value is stored in memory as the proper toner concentration.
If the average value is outside the range of 0 - 99, it is judged as an error and "EE" is displayed in the copy quantity display. In that case, when the PRINT switch is pressed, the display will change as follows:
° EL: Toner concentration value 1.5V or less → (Cause) Defective sensor, developer empty, etc.
° EU: Toner concentration value 3.5V or more → (Cause) Defective sensor, sensor harness disconnection, etc.
iii) If the average value is within the range of 0 - 99, the automatic toner concentration value adjustment is completed.
</td></tr>
<tr><td>26</td><td>
Used to check the zoom lens operation.
• The magnification ratio is displayed in the copy magnification ratio display.
AB series 100% 50% 70% 81% 86%
115% 122% 41% 200%
Inch series 100% 50% 64% 77% 95%
121% 129% 141% 200%
</td></tr>
<tr><td>27</td><td>
• Used for aging of the zoom lens.
• Repeats the operation of test command 26.
</td></tr>
<tr><td>30</td><td>
Used to check the ADF (option) sensor.
<table>
<tr><th>LED</th><th>Sensor</th></tr>
<tr><td>MPL (Maintenance lamp)</td><td>DF section open/close sensor</td></tr>
<tr><td>DVL (Developer maintenance lamp)</td><td>Document presence/empty sensor</td></tr>
<tr><td>CTL (Color toner lamp)</td><td>Document exit sensor</td></tr>
<tr><td>TPL (Toner empty lamp)</td><td>Resist section document width sensor</td></tr>
<tr><td>JPL (Jam lamp)</td><td>Document spare paper feed sensor</td></tr>
</table>
</td></tr>
<tr><td>31</td><td>
Used for aging of the ADF.
The load are operated by the timer and there is need to set document.
</td></tr>
</table>

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td>33</td><td>Used for ADF individual load test. Immediately after execution of this test, "0" is automatically selected. During execution, the quantity to be tested can be changed with the numeric keys.
"0" : MOT paper feed direction rotation
"1" : MOT transport direction rotation, low speed
"2" : MOT transport direction rotation, medium speed
"3" : MOT transport direction rotation, high speed
"4" : Document stopper solenoid ON
To cancel, press the CA key, the CLEAR key, and the INTERRUPT key.</td></tr>
<tr><td>34</td><td>• Used to check the drum separation pawl operation.
• On/off operations are repeated 20 times.</td></tr>
<tr><td>40</td><td>Used to display the content of the developer preset counter of the installed developer unit.
• Display is made similarly to test command 16.
• The color display of the installed developer is similar to test command 25.</td></tr>
<tr><td>41</td><td>Used to display the content of the copy counter of the installed developer.
• Display is made similarly to test command 16.
• The color display of the installed developer is similar to test command 25.</td></tr>
<tr><td>42</td><td>To clear the copy counter of the installed developer unit.
• Display is made similarly to test command 16.
• The color display of the installed developer is similar to test command 25.</td></tr>
<tr><td>45</td><td>Used to set the drum sensitivity to the number on the sensitivity label in the rear frame side of the drum unit.
① When this test command is executed, the set value is displayed in the copy quantity display and the RPL (ready pilot lamp) lights up.
② Pressing the numeric keys when the RPL is on allows setting of "1" to "3."
③ After setting the value, when the PRINT switch is pressed, the RPL goes off and the test command No. is displayed, and the setting is completed.
<table>
<tr><td>Key</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>Sensitivity</td><td>1</td><td>2</td><td>3</td></tr>
</table></td></tr>
<tr><td>46</td><td>Used to adjust copy exposure and copy exposure adjustable range.
For details, refer to [11] COPY EXPOSURE ADJUSTMENT (11-1).</td></tr>
<tr><td>47</td><td>Used to measure the AE sensor output characteristics and to set the gain rank with the measured value.
The mirror base is initialized, scanned about 10cm, and stopped. The ready lamp lights up. When the PRINT switch is pressed, the AE sensor output is measured at gain rank of "0" and copy lamp applying voltage MAX (75V in 100V system and 150V in 200V system). Then the gain rank is measured according to the measured value.
The voltage changes from 7V (150V) to 55V (110V) in the increment of 5V (10V) to memory the AE sensor output characteristics. The values in ( ) are for 200V system.
<table>
<tr><th>AES</th><th>Gain rank</th><th>$\overline{AEG0}$</th><th>$\overline{AEG1}$</th><th>AEG2</th><th>Magnification ratio</th></tr>
<tr><td>2.77 or less</td><td>3</td><td>×</td><td>×</td><td>H</td><td>2.154</td></tr>
<tr><td>2.78 ~ 3.21</td><td>2</td><td>×</td><td>L</td><td>L</td><td>1.867</td></tr>
<tr><td>3.22 ~ 3.65</td><td>1</td><td>L</td><td>H</td><td>L</td><td>1.638</td></tr>
<tr><td>3.66 or more</td><td>0</td><td>H</td><td>H</td><td>L</td><td>1.460</td></tr>
</table>
After completion, the sensor level (after gain setting, MAX) is displayed in two digits of hexadecimal.</td></tr>
<tr><td>48</td><td>Used to set No. 4/5 mirror home position and to adjust the copy magnification ratio in vertical direction.
Test command 48 has two modes according to purposes as shown below:
Entering the reference value of the vertical magnification ratio (when the lens and the main PWB are replaced), and adjusting the vertical copy magnification ratio.
[C] — [=↵] — [0] — [=↵] — [4] — [8] — [PSW] — [=↵]
* For details, refer to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENT, 3. Optical system (2) Adjustment (7-14).
• Entering the reference value of No. 4/5 mirror home position (when the lens and the main PWB are replaced) and adjusting the resolution.
[C] — [=↵] — [0] — [=↵] — [4] — [8] — [PSW]
* For details, refer to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENT, 3. Optical system (2) Adjustment (7-14).</td></tr>
</table>

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td>49</td><td>Used to adjust the horizontal magnification ratio.
By changing the mirror base scanning speed, the horizontal magnification ratio of the copy can be adjusted.
Adjusting method
① Place a scale on the document table facing from front to rear then make a copy in the normal mode and obtain the magnification ratio factor.
Copy magnification ratio correction factor = $\frac{\text{(document size)} - \text{(copy image size)}}{\text{(document size)}} \times 100\%$
② Perform test command 49.
As the ready lamp turns on, the preset value (5 to 35) is displayed.
Enter this value with the magnification ratio correction factor obtained in the above procedure as shown below.
(Input value) = (preset value) + (copy magnification ratio correction factor [%]) x 10
When the PRINT switch is pressed, after entry of the input value, the input value is stored in the memory and the ready lamp goes off.
* For more information, refer to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENTS OPTICAL SYSTEM, (2) Adjustment, Horizontal copy magnification ratio adjustment (7-15).</td></tr>
<tr><td>50</td><td>Used to adjust the copy lead edge image loss and void area.
(Note) This test command can be executed only when the machine goes into the ready state.
* For more information, refer to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENTS OPTICAL SYSTEM, (2) Adjustment, Copy lead edge adjustment (7-20).</td></tr>
<tr><td>58</td><td>Used to adjust the copy lead edge image loss and void area.
For more information, refer to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENTS OPTICAL SYSTEM, (2) Adjustment, Copy lead edge adjustment (7-22).</td></tr>
<tr><td>60</td><td>Used to check the document size photosensor and to enter the detection level. (The document length is detected by the document interruption system.) (also on page 7-22)
① Photo sensor check method
• Key operation: C → [=↵] → 0 → [=↵] → 6 → 0 → PSW
The document size display lamp and the auto paper select lamps light up.
• The document size lamp goes off when the light emitting section of the size detection LED PWB is shaded.
* The photosensor arrangement is as follows:
<table>
<tr><th>Reception axis</th><th>Japan AB series</th><th>Outside Japan AB series</th><th>Outside Japan inch series</th></tr>
<tr><td>1</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>2</td><td>B5</td><td>—</td><td>—</td></tr>
<tr><td>3</td><td>A4</td><td>A4</td><td>LT</td></tr>
<tr><td>4</td><td>B5R</td><td>—</td><td>—</td></tr>
<tr><td>5</td><td>A4R</td><td>A4R</td><td>LTR</td></tr>
<tr><td>6</td><td>B4</td><td>B4</td><td>LG</td></tr>
<tr><td>7</td><td>A3</td><td>A3</td><td>17"</td></tr>
</table>
• The auto paper select lamp is for open/close check of the original cover. (OFF when close).
• When the original cover close is detected, all the document size display lamps go off.
 
</td></tr>
</table>

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td></td><td>② Light reception level setting
• Key operation [C] → [=J] → [0] → [=J] → [6] → [0] → [PSW] → [Auto magnification ratio select key]
The ready lamp (RPL) and the auto magnification ratio select lamp light up.
• With the original cover open without placing paper on it, press the PRINT switch.
• The ready lamp instantaneously goes off and then lights up again. At the same time, the INTERRUPT lamp lights up. (The sensor level without paper is stored in the memory.)
• Place a transfer paper of A3 (17" x 11") on the document table, and press the PRINT switch with the original cover open.
(The sensor level with paper is stored and the judgement level of paper presence/empty is stored.)
• The machine returns to the sensor check mode.
If there is any abnormality in the sensor level, "CC" is displayed.</td></tr>
<tr><td>61</td><td>Used to check the sorter (option) load and the sensor.
① Pressing the numeric key allows to check the following operations:
<table>
<tr><td>"0"</td><td>Transport motor (SFM) sorter bin shift stop</td></tr>
<tr><td>"1"</td><td>Transport motor (SFM) ON</td></tr>
<tr><td>"2"</td><td>Sorter bin shift up</td></tr>
<tr><td>"3"</td><td>Sorter bin shift down</td></tr>
</table>
② With the display lamps, ON/OFF operation of the switch can be checked.
<table>
<tr><td>MPL (Maintenance lamp)</td><td>Sorter bin home position sensor</td></tr>
<tr><td>TPL (Toner lamp)</td><td>Sorter home bin SW</td></tr>
<tr><td>DVL (Developer lamp)</td><td>Sorter door SW</td></tr>
</table></td></tr>
<tr><td>70</td><td>Used to check ADF count.
The display is made similarly to test command 16.</td></tr>
<tr><td>72</td><td>Used to set the maintenance cycle.
Setting procedure
① When this test command is executed, the preset values of the copy kit or the maintenance lamp count No. are displayed and the ready lamp lights up.
② After the ready lamp lights up, enter the maintenance lamp set code with the 0 ~ 2 keys. Press the print switch, and the set code is stored in the memory and the ready lamp goes off.
<Outside Japan>
<table>
<tr><th rowspan="2">Set code</th><th colspan="2">Developer lamp</th><th rowspan="2">Maintenance lamp</th></tr>
<tr><th>Black</th><th>Color</th></tr>
<tr><td>0</td><td>30,000 sheet</td><td>10,000 sheet</td><td>10,000 sheet</td></tr>
<tr><td>1</td><td>30,000 sheet</td><td>10,000 sheet</td><td>15,000 sheet</td></tr>
<tr><td>2</td><td>30,000 sheet</td><td>10,000 sheet</td><td>30,000 sheet</td></tr>
<tr><td>3</td><td>Not lighted.</td><td>10,000 sheet</td><td>Not lighted.</td></tr>
</table></td></tr>
<tr><td>77</td><td>Used to enter the lens characteristics when replacing the lens.
Setting procedure
① When this test command is executed, the preset value is displayed and the ready lamp lights up.
② After the ready lamp lights up, enter the lens number, press the print switch, and the preset value is stored in the memory and the ready lamp goes off.
Refer to [7] DISASSEMBLY, ASSEMBLY AND ADJUSTMENT, 3. Optical system, (2) Adjustments (7-16).</td></tr>
</table>

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td>78</td><td>
Used to set the counter mode.
① When this test command is executed, the preset mode set code is displayed and the ready lamp lights up.
② After the ready lamp lights up, enter the set code with the 10 key, press the PRINT switch, and the set code is stored and the ready lamp goes off.
<table>
<tr><th>Set code</th><th>Timer auto clear</th><th>Total counter (Single/Double)</th><th>Maintenance counter (Single/Double)</th></tr>
<tr><td>0</td><td>O</td><td>Double count</td><td>Double count</td></tr>
<tr><td>1</td><td>O</td><td>Single count</td><td>Double count</td></tr>
<tr><td>2</td><td>O</td><td>Double count</td><td>Single count</td></tr>
<tr><td>3</td><td>O</td><td>Single count</td><td>Single count</td></tr>
<tr><td>40</td><td>×</td><td>Double count</td><td>Double count</td></tr>
<tr><td>41</td><td>×</td><td>Single count</td><td>Double count</td></tr>
<tr><td>42</td><td>×</td><td>Double count</td><td>Single count</td></tr>
<tr><td>43</td><td>×</td><td>Single count</td><td>Single count</td></tr>
</table>
O – enabled
× – disabled
</td></tr>
<tr><td>79</td><td>
Used to set the model and destination.
① When this test command is executed, the preset code of machine state is displayed and the ready lamp lights up.
② After the ready lamp lights up, enter the set code for the machine state with the numeric keys and press the PRINT switch, and the set data is stored and the ready lamp lights up.
<table>
<tr><th>Britain (SUK)</th><th>Outside Britain (Outside japan AB series)</th><th>Inch series (USA)</th><th>Inch series (Outside USA)</th></tr>
<tr><td>1</td><td>5</td><td>6</td><td>7</td></tr>
</table>
• Indonesia: If it was set to the Indonesian version, installation of other than black developer is disregarded ("CH" displayed).
</td></tr>
<tr><td>80</td><td>
• When any option is installed, perform this test command.
① [C] → [=J] → [0] → [=J] → [8] → [0] → [PSW]
② Calculate total of set code of options installed, set total.
<table>
<tr><th>Option</th><th>Model</th><th>Code</th></tr>
<tr><td>ADF</td><td>SF-A12</td><td>1</td></tr>
<tr><td>Multi-paper feed unit</td><td>SF-MF12</td><td>4</td></tr>
<tr><td>Sorter</td><td>SF-S12</td><td>20</td></tr>
</table>
• Enter the code corresponding to the options as shown in the above table.
Example: When setting SF-A12, MF12, and S12, the code to be entered is 1 + 4 + 20 = 25. Enter 25.
Note:
(1) Be sure to follow the above table for setting.
(2) If not, some trouble may occur.
</td></tr>
<tr><td>92</td><td>
Used to check the sensor level of the lower cassette paper detection.
This test command has following two mode:
① Sensor monitor mode
[C] → [=J] → [0] → [=J] → [9] → [2] → [PSW]
The cassette paper sensor level is displayed in hexadecimal number in the copy quantity display.
② Sensor judgement level check mode
[C] → [=J] → [0] → [=J] → [9] → [2] → [PSW] → [Auto magnification ratio select key]
The paper sensor paper presence/empty judgement level set with test command 98 is displayed in hexadecimal number in the copy quantity display.
</td></tr>
</table>

<table>
<tr><th>Test command</th><th>Function</th></tr>
<tr><td>94</td><td>Used to check the document sense level.
① Light reception level display mode
[C] → [=⌟] → [0] → [=⌟] → [9] → [4] → [PSW]
• The light reception level during execution of the test command is displayed in the copy quantity display.
• When the value corresponding to each sensor is entered with numeric keys after execution of this test mode, the corresponding document size display lamp lights up. This allows checking of the sensor light reception level.
• The auto paper select lamp is for checking the original cover open/close. On for open, off for close.
In the case of ①, if the original cover is closed, the sensor level is fixed at the previous value.
② Set level display mode
[C] → [=⌟] → [0] → [=⌟] → [9] → [4] → [PSW] → [Auto magnification select key]
• With the above key operation, the INTERRUPT lamp lights up.
• The sensor level set with test command 60 is displayed in the copy quantity display.
• When the value corresponding to each sensor is entered with numeric keys after execution of this test mode, the corresponding document size display lamp lights up. This allows checking of the sensor light reception level.</td></tr>
<tr><td>96</td><td>Used to set the fusing temperature.
When this test command is executed, the lower two digits of the preset temperature is displayed. (Example: 75 --- 175 degree C)
When the auto magnification ratio select key is pressed under this state, the fusing temperature can be changed in the increment of 5 degree C.
<table><tr><th>Destination</th><th>Standard set value</th><th>Variable range</th></tr><tr><td>Japan</td><td>185°C</td><td>165°C ~ 200°C</td></tr><tr><td>USA</td><td>190°C</td><td>170°C ~ 205°C</td></tr><tr><td>Others</td><td>190°C</td><td>180°C ~ 205°C</td></tr></table>∗ Do not change the set value unnecessarily.</td></tr>
<tr><td>98</td><td>Used for the lower cassette paper sensor (RPED) check adjustment.
① [C] → [=⌟] → [0/◊] → [=⌟] → [9] → [8] → [PSW]
The machine goes into the paper sensor check mode, and the paper sensor state is displayed with the paper empty lamp. (ON when paper empty is detected.)
When the auto magnification select key is pressed at that time, the auto magnification select lamp lights up to show that the machine is in the paper sensor adjustment mode. The ready lamp lights up at the same time.
② Set paper in the lower cassette, install the cassette to the machine, and press PSW.
The sensor value is temporarily stored in the memory and the interruption lamp lights up.
③ Remove paper from the lower cassette, install the cassette to the machine and press PSW.
The paper presence/empty level is calculated from the sensor value and the temporarily stored value in ②, and the obtained value is stored in the memory. The machine goes into the paper sensor check mode simultaneously.
If there is any abnormality in the sensor level, "CC" is displayed in the copy quantity display.</td></tr>
</table>

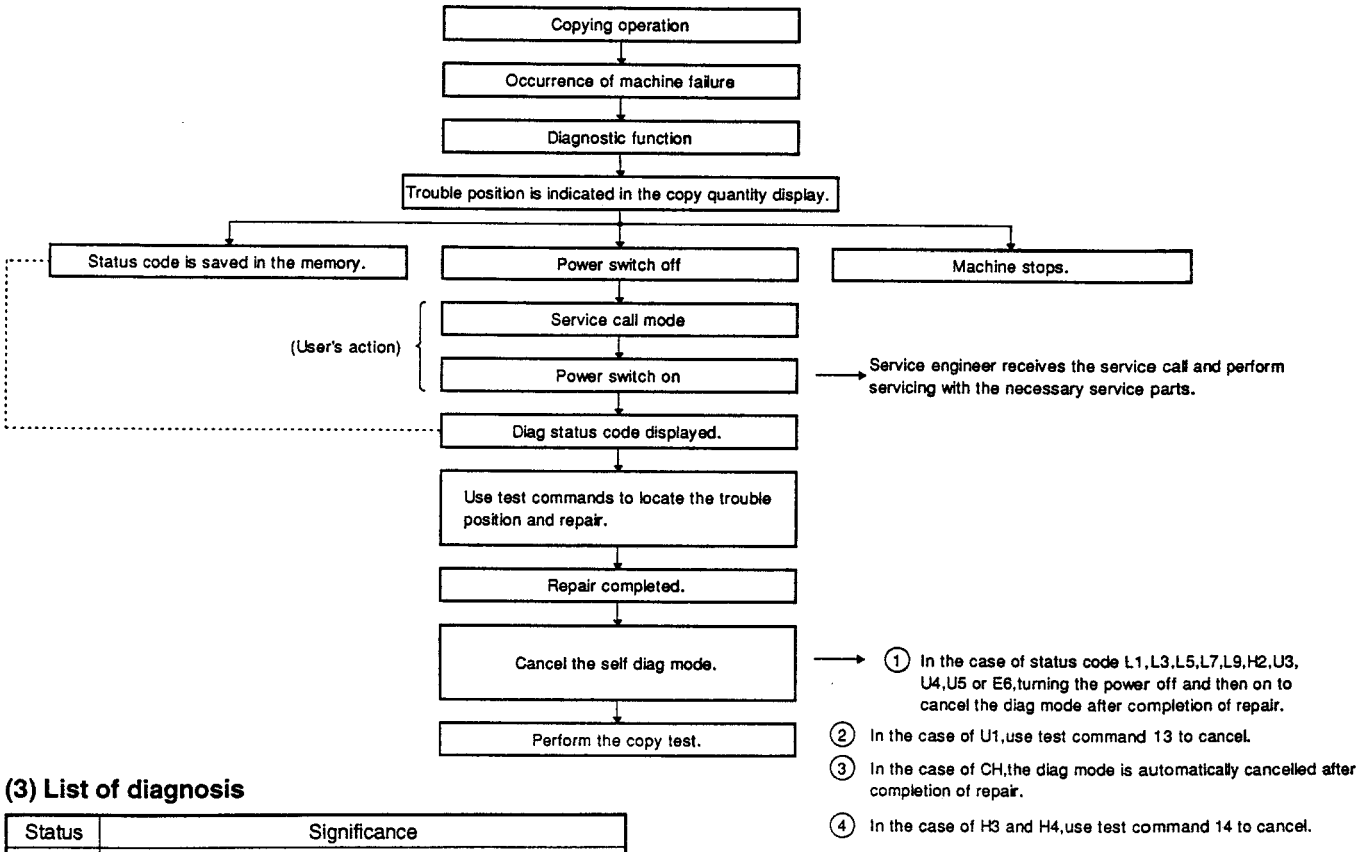
2. Diagnosis

(1) Purpose

The diagnostic program is provided for the following purposes:

- Occurrence of an abnormal condition in the machine is detected by the machine itself and the trouble status is displayed in the copy quantity display to inform the operator or service engineer of an error.
- When trouble is detected, the power is turned off to prevent the load components within the copier from damage.

(2) Outline


Copying operation
Occurrence of machine failure
Diagnostic function
Trouble position is indicated in the copy quantity display.
Status code is saved in the memory.
Power switch off
Machine stops.
(User's action)
Service call mode
Power switch on
Service engineer receives the service call and perform servicing with the necessary service parts.
Diag status code displayed.
Use test commands to locate the trouble position and repair.
Repair completed.
Cancel the self diag mode.
① In the case of status code L1,L3,L5,L7,L9,H2,U3, U4,U5 or E6,turning the power off and then on to cancel the diag mode after completion of repair.
② In the case of U1,use test command 13 to cancel.
③ In the case of CH,the diag mode is automatically cancelled after completion of repair.
④ In the case of H3 and H4,use test command 14 to cancel.
Perform the copy test.

(3) List of diagnosis

Status	Significance
L1	Mirror feed trouble
L2	Mirror feed trouble
L3	Mirror return trouble
L5	Lens trouble
L8	Full wave signal error
L9	Sorter trouble
EE	Automatic developer adjustment error
EU, EL	Automatic developer adjusting sensor input error
CH	Door open
CC	Document sense trouble
PC	Counter not installed
U1	Low battery voltage
U2	Backup memory error
U3	AE sensor trouble
U5	ADF system trouble
H2	Thermistor open
H3	High temperature trouble
H4	Low temperature trouble

(4) Details of self diagnosis

Status	Cause No.	Trouble description	Cause	Test command
L1	—	The forward scan is not completed within 10 sec after the mirror starts moving.	Mirror motor control PWB failure, Mirror motor failure	1, 2
L2	1	Mirror motor lock	Mirror motor control PWB failure, Mirror motor failure	1, 2
	2	Mirror home position sensor (MHPS) trouble	Mirror motor control PWB failure, Mirror motor failure	1, 2
L3	—	Mirror returning is not completed within 10 sec from the initial start in the case of mirror initialization and from the completion of copying in the case of copying operation.	MHPS failure Mirror motor control PWB failure, Mirror motor failure	1, 2
L5	0	Lens move is not completed within 12.5 sec after the lens started to move.	Lens motor, LHPS failure	26, 27
	1	No. 4/5 mirror stepping motor trouble	No. 4/5 stepping motor failure, No. 4/5 mirror home position sensor failure	26, 27
	2	No. 4/5 mirror home position sense trouble	Main PWB	26, 27
	4	Lens stepping motor trouble	Lens motor failure, main PWB	26, 27
	8	Lens home position sense trouble	Lens home position sensor, main PWB	26, 27
L8		Full wave signal abnormality		—
L9	11	Sorter home position is not detected within 10 sec from resetting the sorter home bin.	Home position sensor failure, motor failure	61
	13	The standby position is failed to keep after shift operation completed within 1.1 sec after sorter 1-bin shift operation.	Index stop position sense SW failure, motor failure	61
H2	—	Thermistor open detection, thermistor open or the fusing unit is not installed when the door is closed.	Thermistor open	—
H3	—	Heat roller abnormally high temperature	Triac shorted	6 → 14
H4	—	The set temperature is not reached within 90 sec after turning on the power. (the heater lamp lights up after 1 sec from turning on the power relay.) After reaching the specified temperature, abnormal temperature is detected.	Heater lamp open Defective installation of thermistor Thermostat open	6
U1	—	Low battery voltage for backup memory		13
U2	—	Sum check error in the backup memory counter		—
U3	80	AE sensor trouble In test command 47, AE sensor output level does not change for the copy lamp light intensity.	AE sensor, main PWB failure	—
U5	0	ADF communication trouble	Harness, ADF control PWB failure	—
	1	ADF motor drive failure	Motor failure, motor rotation sensor failure	30, 31, 33
EE		Automatic developer adjustment trouble Sensor level input error * Occurs after automatic developer adjustment with test command 25.	Toner control sensor failure	25
EL		Sensor level input error (Over toner) * Occurs during sensor level reading with test command 25.	Toner control sensor failure	25
EU		Sensor level input error (Under toner) * Occurs during sensor level reading with test command 25.	Toner control sensor failure	25
CC		Document sensor trouble. When the level difference between paper presence and paper empty is less than 4 steps in test command 60. (1 step = 5V/256)	LED PWB failure, Light receiving PWB failure, arm unit adjustment failure	60 94
CH	(ON)	Door switch is not turned on. (The interlock switch is ON.)	—	—
CH	(Blink)	• The DV tank is not installed.	—	—
PC		• The personal counter is not installed. • The personal counter connector is disconnected.	—	

[11] COPY EXPOSURE ADJUSTMENT

The copy exposure adjustment should be performed in the following cases:

- When maintenance is performed.
- When the main corona output current, or the grid voltage is adjusted. (When the corona unit or the high voltage unit is replaced.)
- When the developer bias is adjusted.
- When the AC PWB unit and CL-reg circuit part are replaced.
- When the AE sensor is replaced.
- When the copy lamp is replaced.
- When the optical unit is replaced.
- When the optical unit id disassembled, repaired, or adjusted.
- When the exposure adjustment plate is moved.
- When the drum is replaced.
- When the main PWB is replaced.

1. Note for copy exposure adjustment

Before performing the copy exposure adjustment, perform the following procedures.

① Clean the optical system (Table glass, lens, mirror, copy lamp, reflector).

② Clean the AE sensor. (Wipe the photo sensor surface with cloth immersed in alcohol or water).
Note: Do not use a dry cloth, because it may charge the sensor surface to attract dusts.

③ Clean the corona wires and screen grids. (Main corona, transfer corona)

④ Clean the blank lamps and the discharge lamps around the drum holder unit.

Note: Perform the manual copy exposure adjustment first, then perform the automatic copy exposure adjustment. Do not reverse the sequence.

2. Copy exposure adjustment procedure

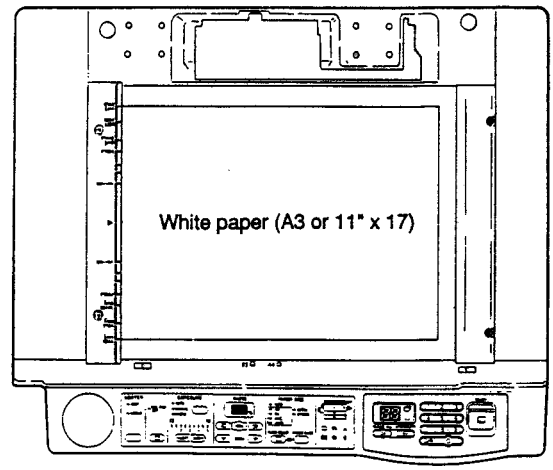
(1) Automatic copy exposure level adjustment

Refer to the "Automatic copy exposure adjustment" in [3] UNPACKING AND INSTALLATION, and set the automatic copy exposure level to 3. (3-7)

(2) AE sensor level adjustment

① Perform test command 47. (The mirror base scans and stops at the AE sensor level measurement position.)

② Place 4 or 5 sheets of white paper (A3 or 11" x 17") on the document table in the center reference.



③ Press the PSW again. (The copy lamp lights up and the sensor level is stored in the memory.)

(3) Drum sensitivity setting

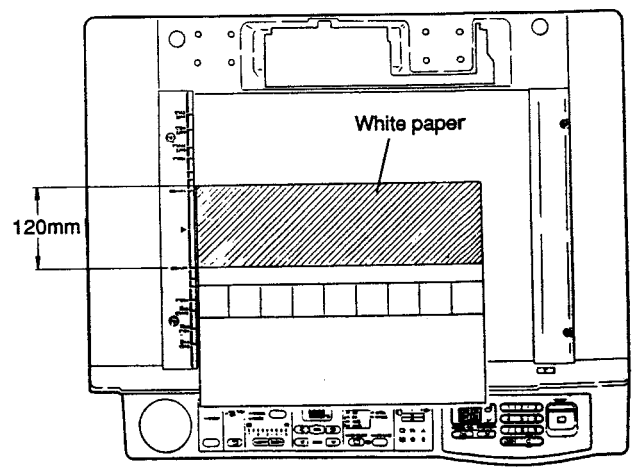
① Perform test command 45, and check that the second digit of lot number in the label attached to the cartridge or the top digit of the 9-digit drum number printed on the flange in the drum front frame side in the copy quantity display.

② If the displayed number is different from the top digit of the sensitivity code, press the copy quantity set key to adjust the value. Then, press the PSW.
(Refer to the "Drum sensitivity setting" in [3] UNPACKING AND INSTALLATION. (3-7)

* The drum produced up to the mid-November has a 7-digit lot number found on the drum flange, which means there are no sensitivity number and the applicable model code provided, except that the drum sensitivity is all set to "2".
Since "2" had been entered when the machine left the factory, confirmation is required using the test command 45.

(4) Test chart setting

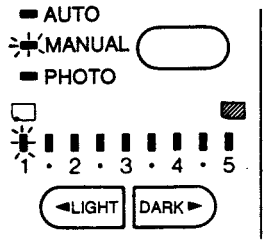
Place four sheets of paper (Sharp specification, about 120mm wide and about 420mm long) on the document table in the center reference. Set the test chart (UKOG-0089CSZZ, UKOG-0162FCZZ) or Kodak gray scale.



(5) Copy exposure adjustment procedure

A. Manual mode copy exposure check

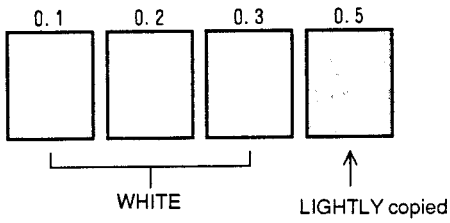
① Perform test command 46 (copy exposure adjustment). The manual copy mode exposure is displayed in the exposure display on the operation panel.



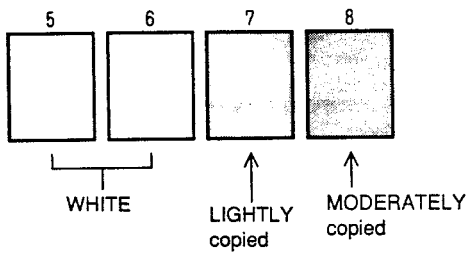
② In manual exposure mode 1.0, make a copy.

For each test chart, check as follows:

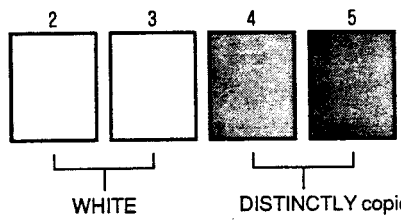
- When UKOG-0089CSZZ is used:



- When UKOG-0162FCZZ is used.



- When Kodak gray scal is used:



<When the copy is too light>

Set a smaller value than the displayed value in the copy quantity display. (Use the copy quantity set key.)

<When the copy is too dark>

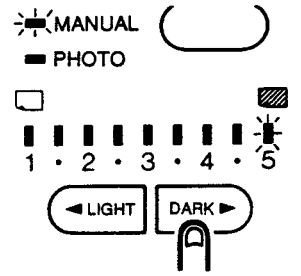
Set a larger value than the displayed value in the copy quantity display.

* The set value range is 1 to 99.

(Note) During test command 46 execution, never press the CLEAR key. (To change the set value, no need to press the CLEAR key, but just enter the desired value.)

③ Make a copy.

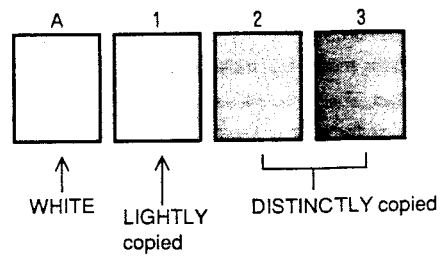
When the copy exposure is within the specified range, press the DARK key, until exposure 5 is displayed in the exposure display on the operation panel.



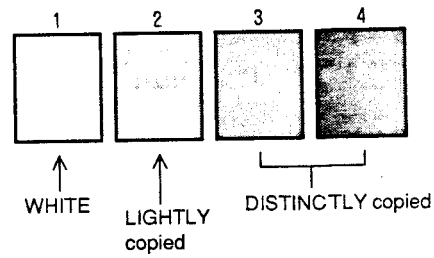
④ In manual mode exposure 5.0, make a copy.

For each test chart, check as follows:

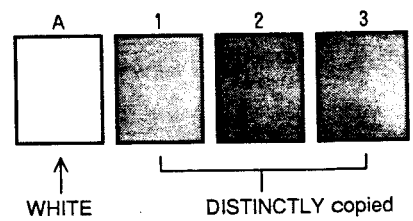
- When UKOG-0089CSZZ is used.



- When UKOG-0162FCZZ is used:



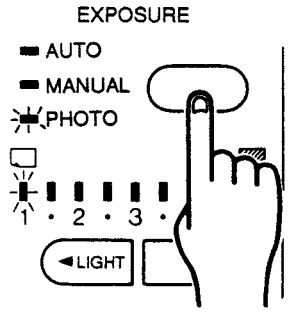
- When Kodak gray scale is used:



To adjust the exposure, perform the same procedure as exposure 1 setting.

B. Photo mode copy exposure check

① Select the photo mode with the mode select key.
The photo mode exposure "5" is displayed in the copy exposure display on the operation panel.



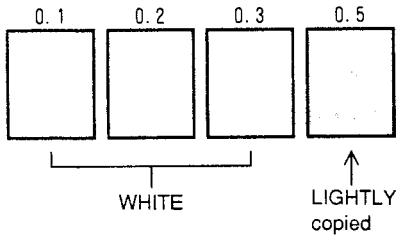
② Perform the same procedure as the manual copy exposure check with exposure 1 and exposure 5.
The copy exposure reference in the photo mode differs according to the destinations.

- For U.S.A., Canada, and United Kingdom, adjust with the following reference.
- For the other destinations, adjust with the copy exposure reference in the manual mode.

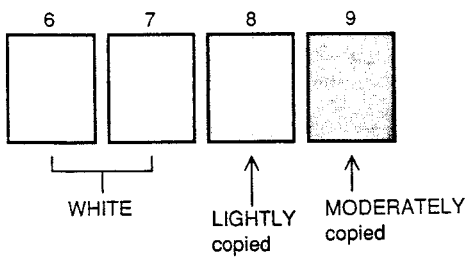
③ In manual exposure mode 1.0, make a copy.

For each test chart, check as follows:

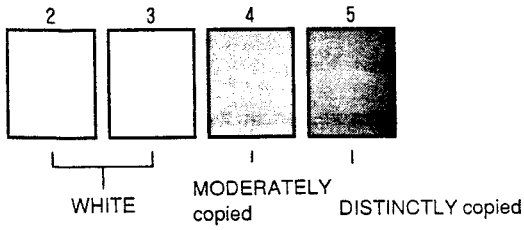
- When UKOG-0089CSZZ is used:



- When UKOG-0162FCZZ is used.



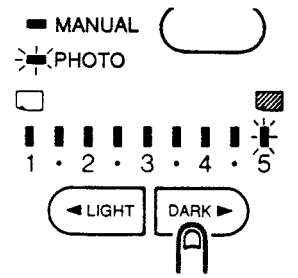
- When Kodak gray scal is used:



<When the copy is too light>
Set a smaller value than the displayed value in the copy quantity display. (Use the copy quantity set key.)

<When the copy is too dark>
Set a larger value than the displayed value in the copy quantity display.
* The set value range is 1 to 99.

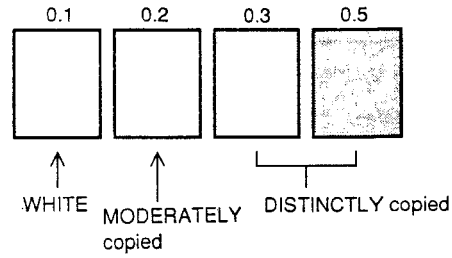
④ Make a copy.
When the copy exposure is within the specified range, press the DARK key, until exposure 5 is displayed in the exposure display on the operation panel.



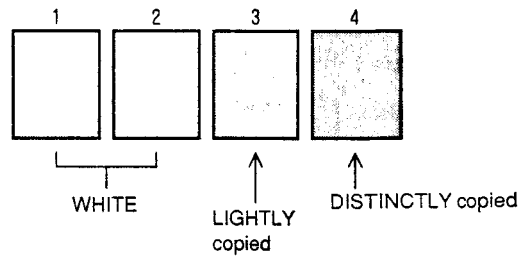
⑤ In manual mode exposure 5.0, make a copy.

For each test chart, check as follows:

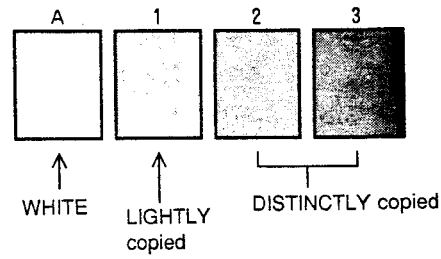
- When UKOG-0089CSZZ is used.



- When UKOG-0162FCZZ is used:



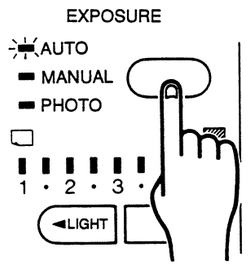
- When Kodak gray scale is used:



To adjust the exposure, perform the same procedure as exposure 1 setting.

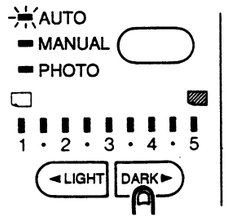
c. Perform the copy check in the automatic exposure mode.

① Select the auto mode with the mode select key.
Automatic exposure 1 is displayed in the exposure display in the operation panel.



② Check that "0" is displayed in the copy quantity display.
If display is not "0," set to "0."

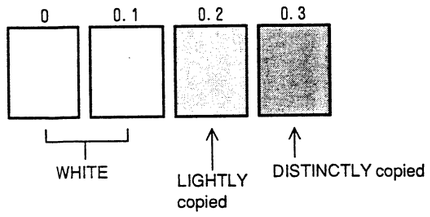
③ Press the "DARK" key.
Exposure 5 is displayed in the exposure display in the operation panel.



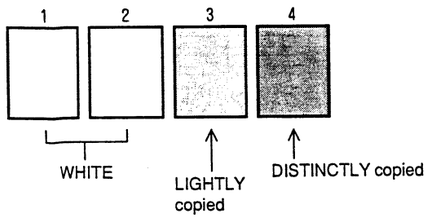
④ In the automatic copy mode, make a copy.

For each test chart, check as follows:

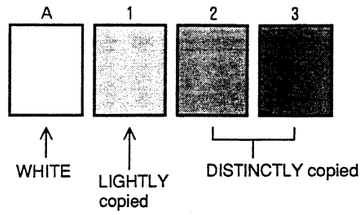
- When UKOG-0089CSZZ is used:



- When UKOG-0162FCZZ is used:



- When Kodak gray scale is used:



- If the copy exposure is too dark or too light, adjust in the same manner as EX5 in the manual copy mode.

⑤ Cancel test command 46.

[12] CIRCUIT DIAGRAM

MAIN CONTROL CIRCUIT-1

IC1 M37700M4FP116

IC2 27C512-150

IC3 M66500FP

IC4 74HC373

IC5 74LS14

IC6 74F32

IC7 74LS139

IC8 74F32

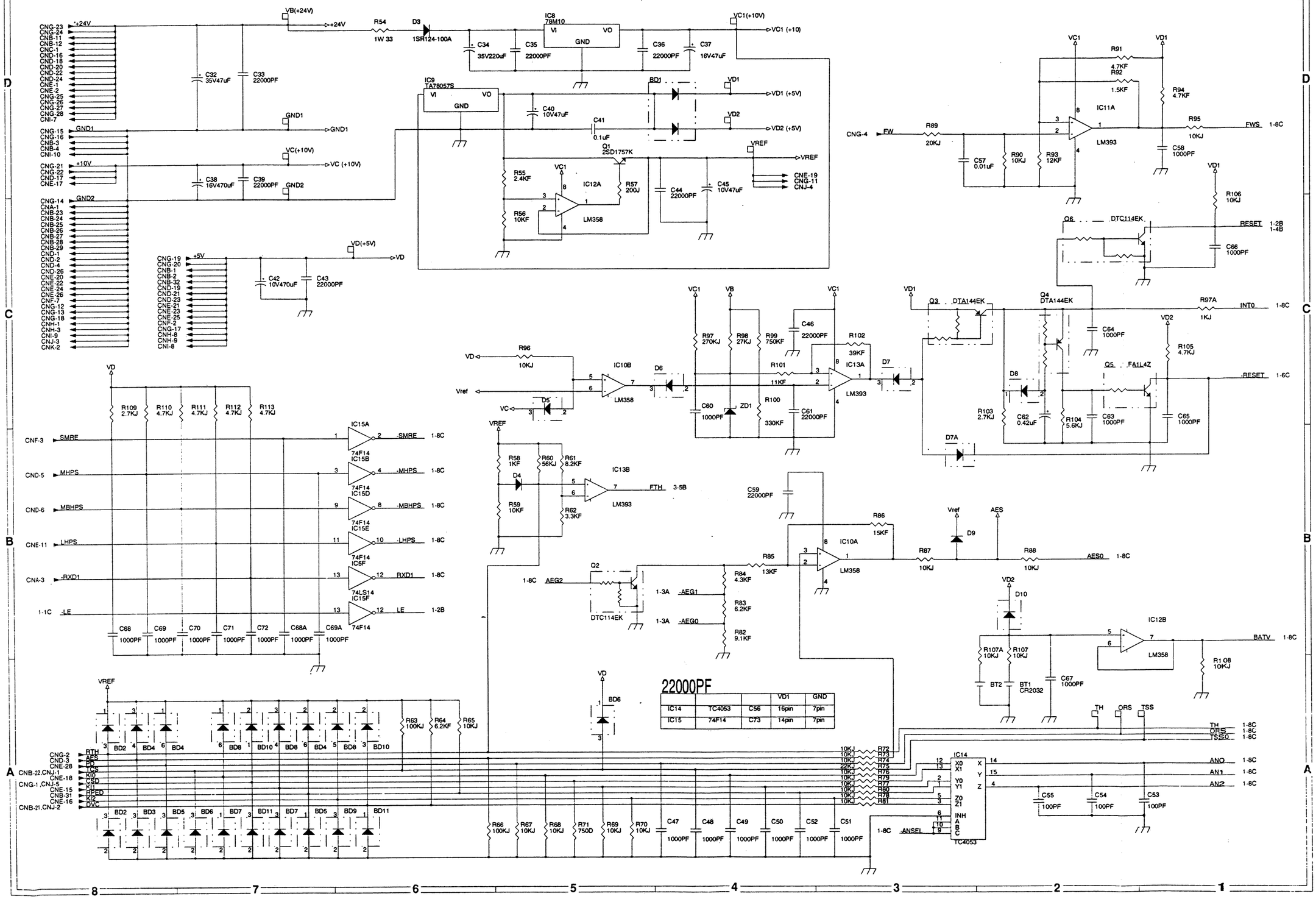
47uF

			VD1	GND
IC4	74HC373AF	C31	20pin	10pin

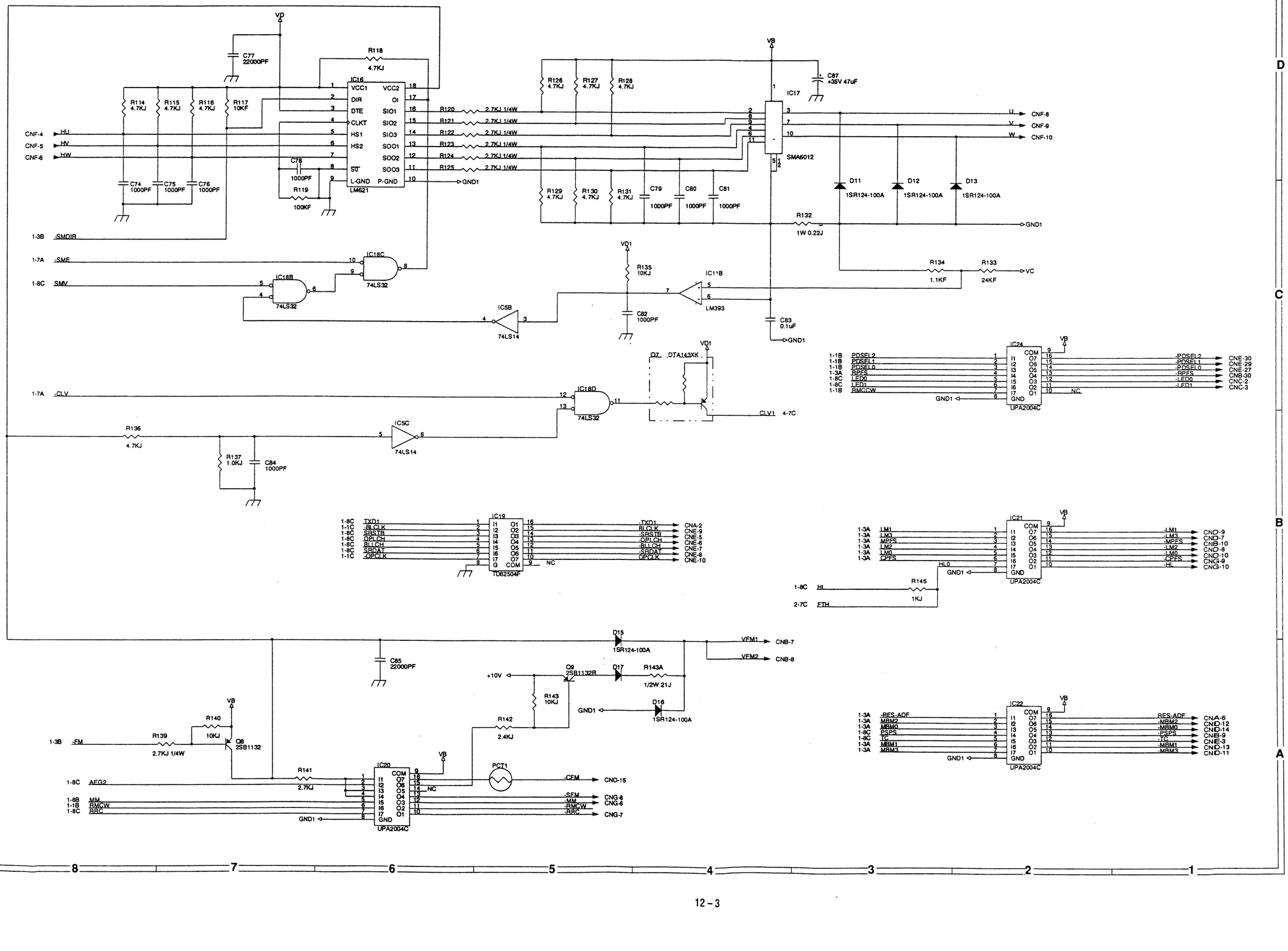
22000PF

			VD1	GND
IC4	74HC373AF	C30	20pin	10pin
IC5	74LS14	C7	14pin	7pin
IC6	74F32	C10	14pin	7pin
IC7	74LS139	C29	16pin	8pin

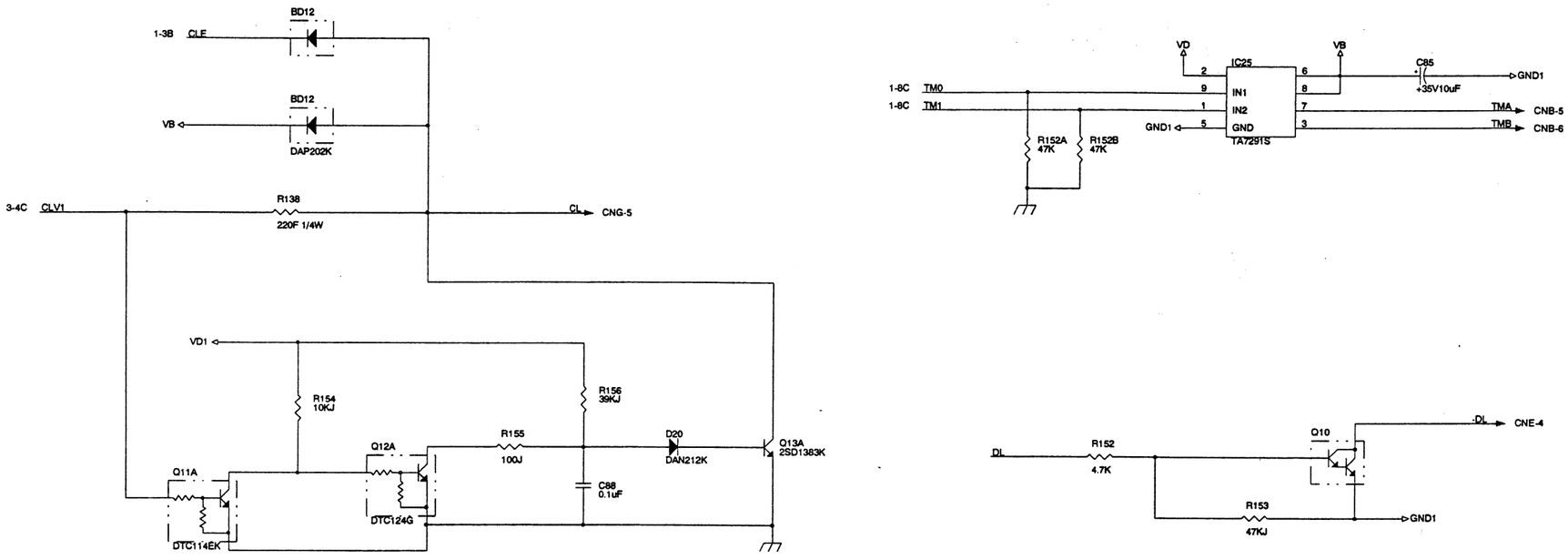
MAIN CONTROL CIRCUIT-2



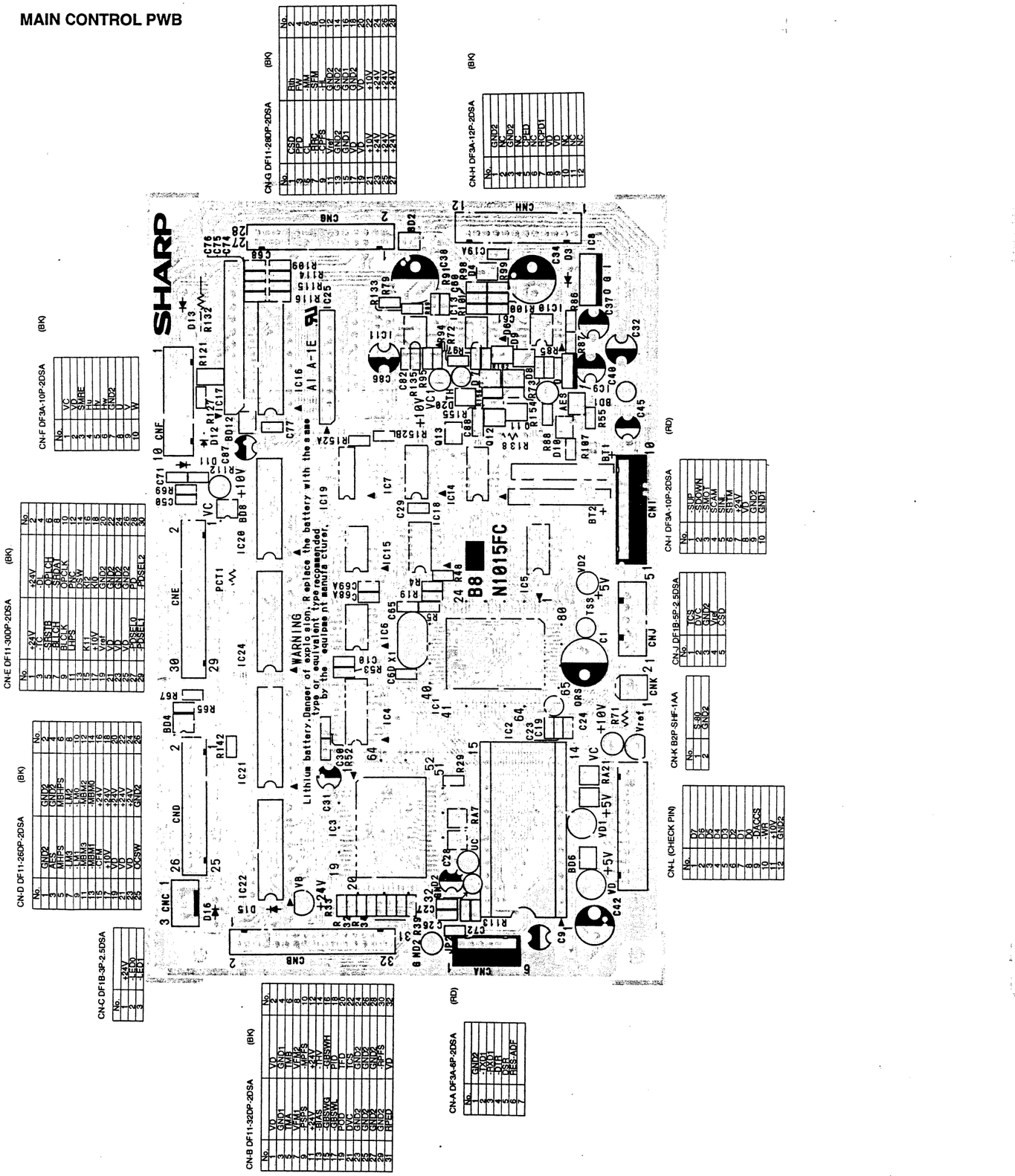
MAIN CONTROL CIRCUIT-3

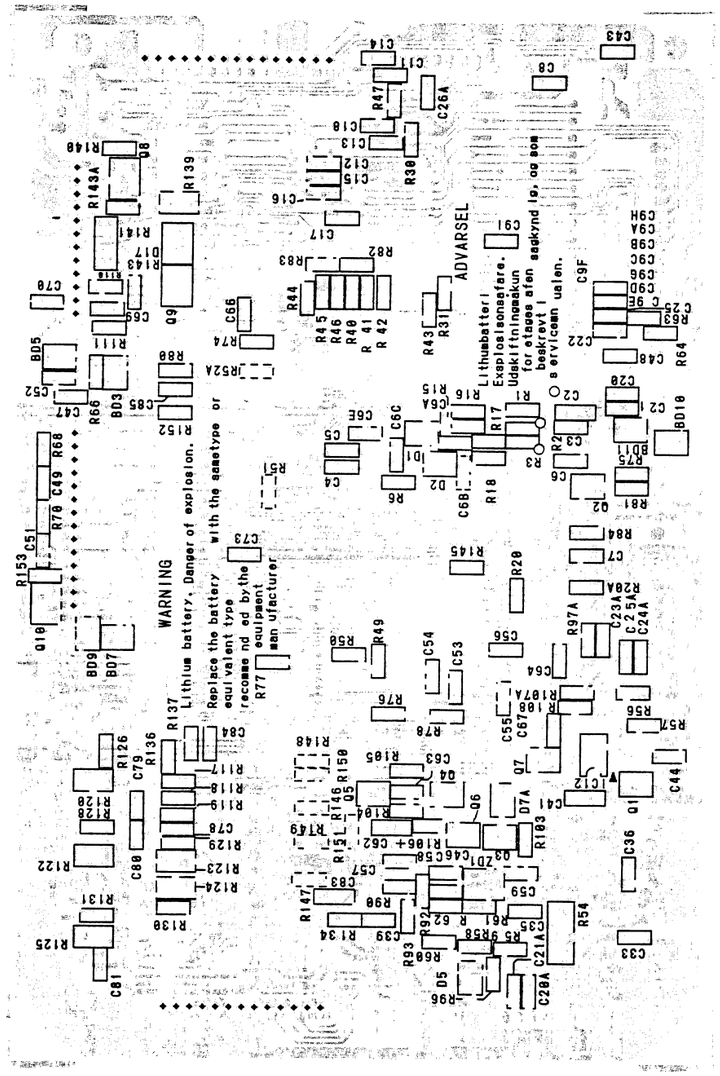


MAIN CONTROL CIRCUIT-4

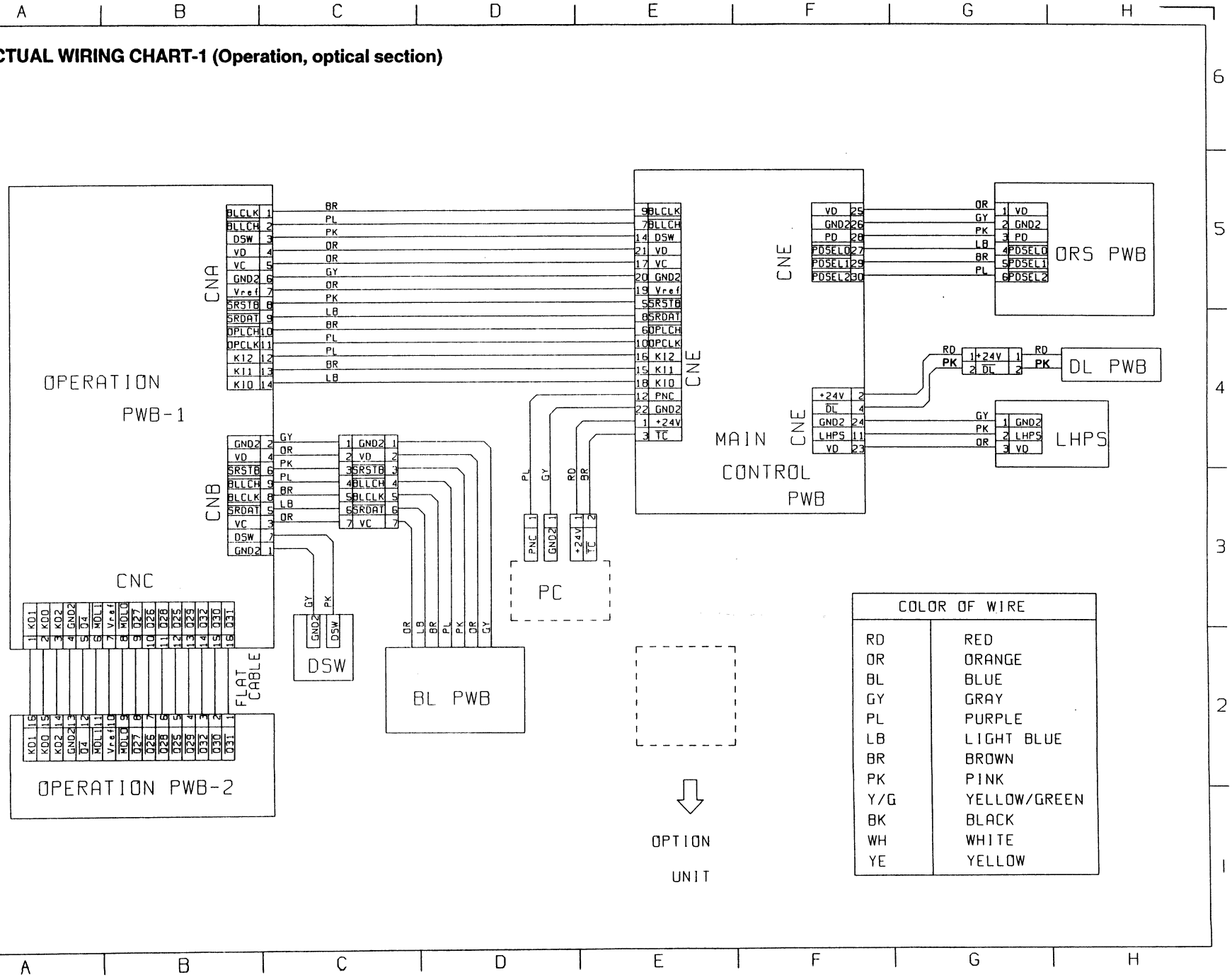


MAIN CONTROL PWB

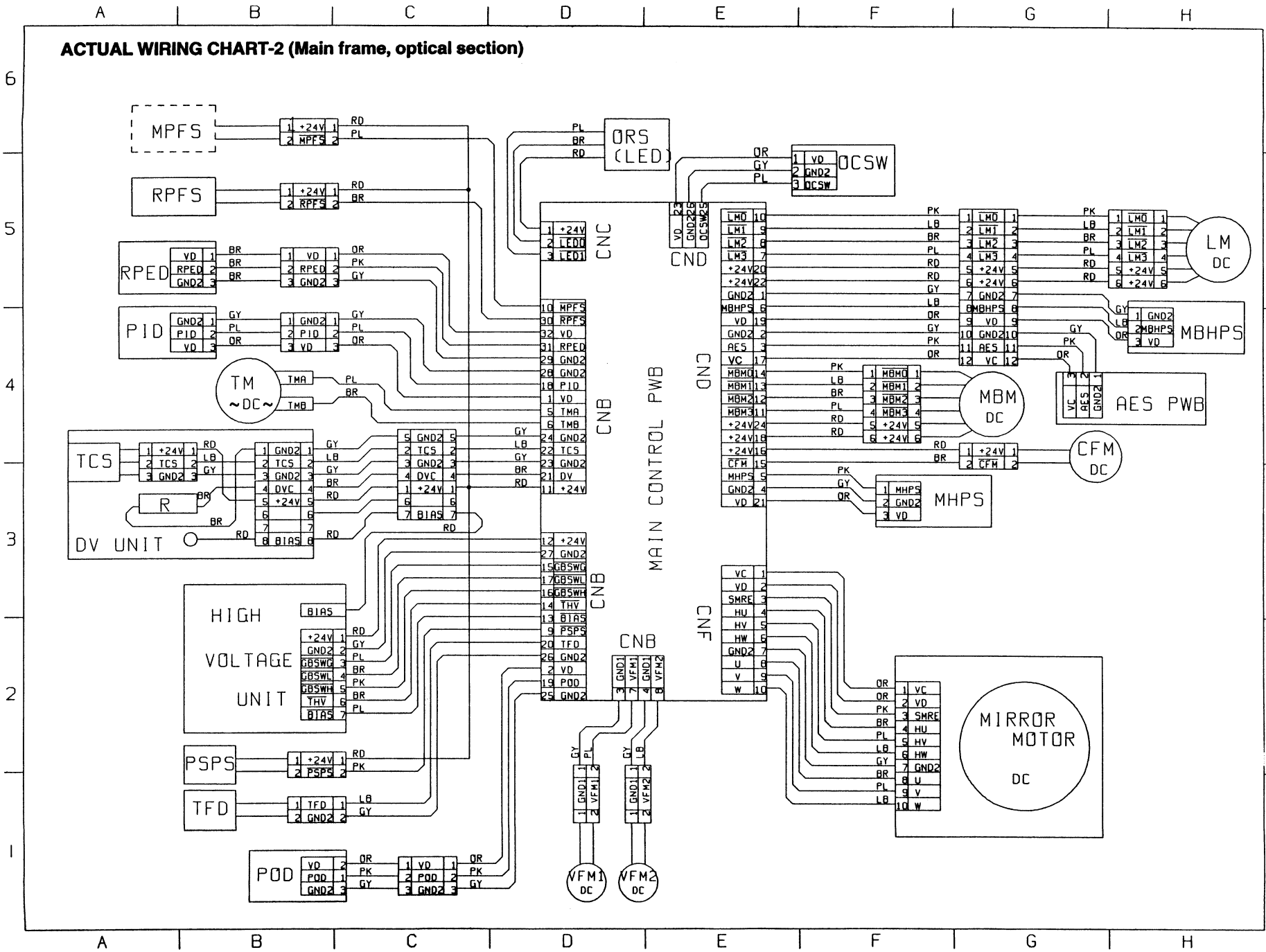



WARNING
Lithium battery, Danger of explosion.
Replace the battery with the same type or equivalent type recommended by the equipment manufacturer
ADVARSEL
Lithiumbatteri! Eksplosionsfare. Udskiftning skal kun ske med batteritype anbefalet af udstyrsfabrikanten.
Varning! Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.

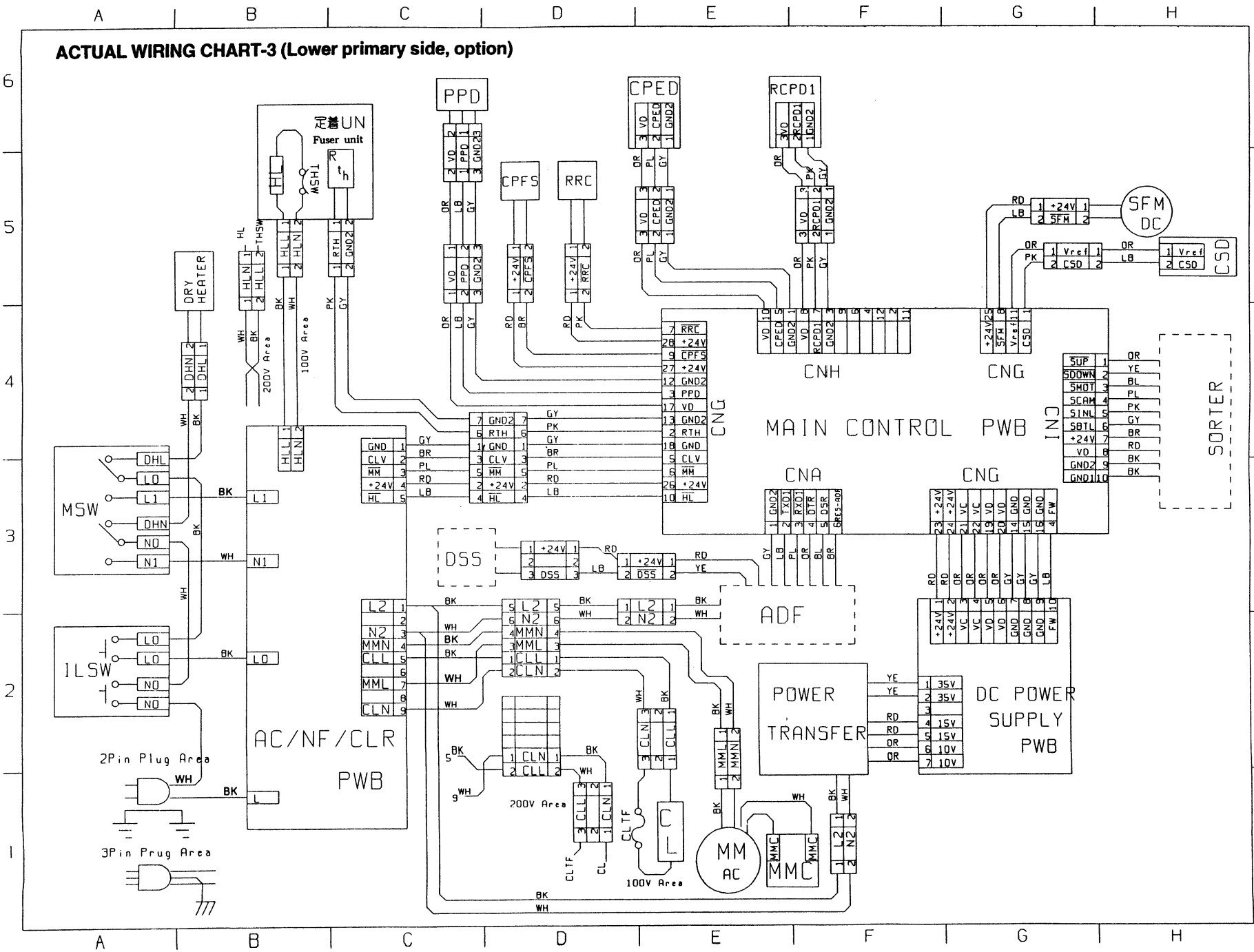
ACTUAL WIRING CHART-1 (Operation, optical section)



ACTUAL WIRING CHART-2 (Main frame, optical section)



ACTUAL WIRING CHART-3 (Lower primary side, option)



SHARP PARTS GUIDE

MODEL SF-7855/7830

CONTENTS

1	Exteriors	423	RM frame unit
10	Lower cassette	804	Main PWB
90	Packing material & Accessories	■	Index

DEFINITION

The definition of each Rank is as follows and also noted in the list

A : Parts necessary to be stocked as High usage parts.

B : Parts necessary to be stocked as Standard usage parts.

C : Low usage parts.

D : Parts necessary for refurbish.

E : Unit parts recommended to be stocked for efficient after sales service.
Please note that the lead time for the said parts may be longer than normal parts.

S : Consumable parts.

Please note that the following parts used in Copier under the same description are classified into A or B Rank depending upon the place used.

Example : Gear made of Metal, Sprocket, Bearing, Belt made of Rubber, Spring clutch mechanism.

A Rank : The parts which may be with the revolution or loading.

B Rank : Parts similar to A Rank parts, but are not included in Rank A.

Because parts marked with "⚠" is indispensable for the machine safety maintenance and operation, it must be replaced with the parts specific to the product specification.

CPS

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
403	CCAB-0715FC12	BA	N	E	Front exterior unit (USA only)	(SF-7855)
	CCAB-0715FC13	AZ	N	E	Front exterior unit (Australia only)	(SF-7855)
	CCAB-0715FC15	AZ	N	E	Front exterior unit (Indonesia only)	(SF-7855)
	CCAB-0715FC14	BA	N	E	Front exterior unit (Other countries)	(SF-7855)
	CCAB-0715FC16	BA	N	E	Front exterior unit (U.K. Germany)	(SF-7830)

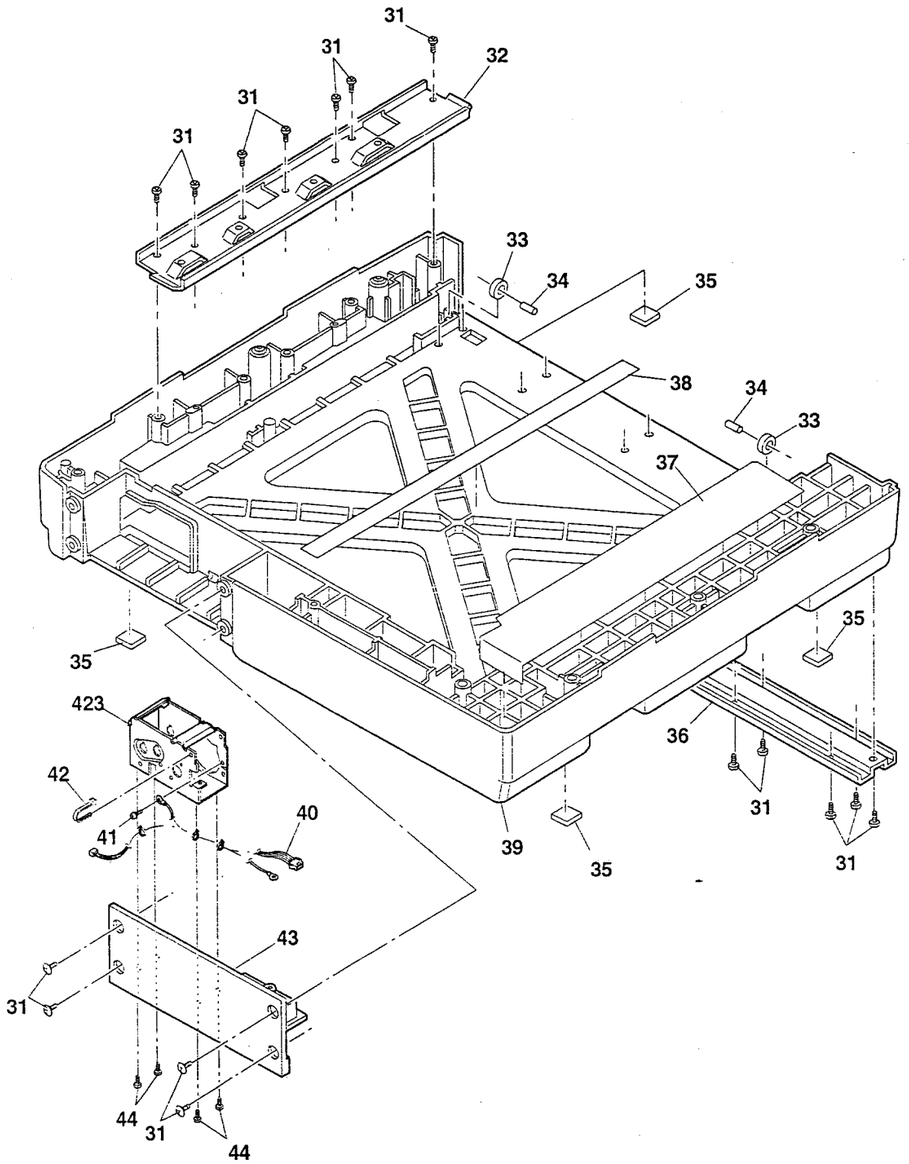
10 Lower cassette

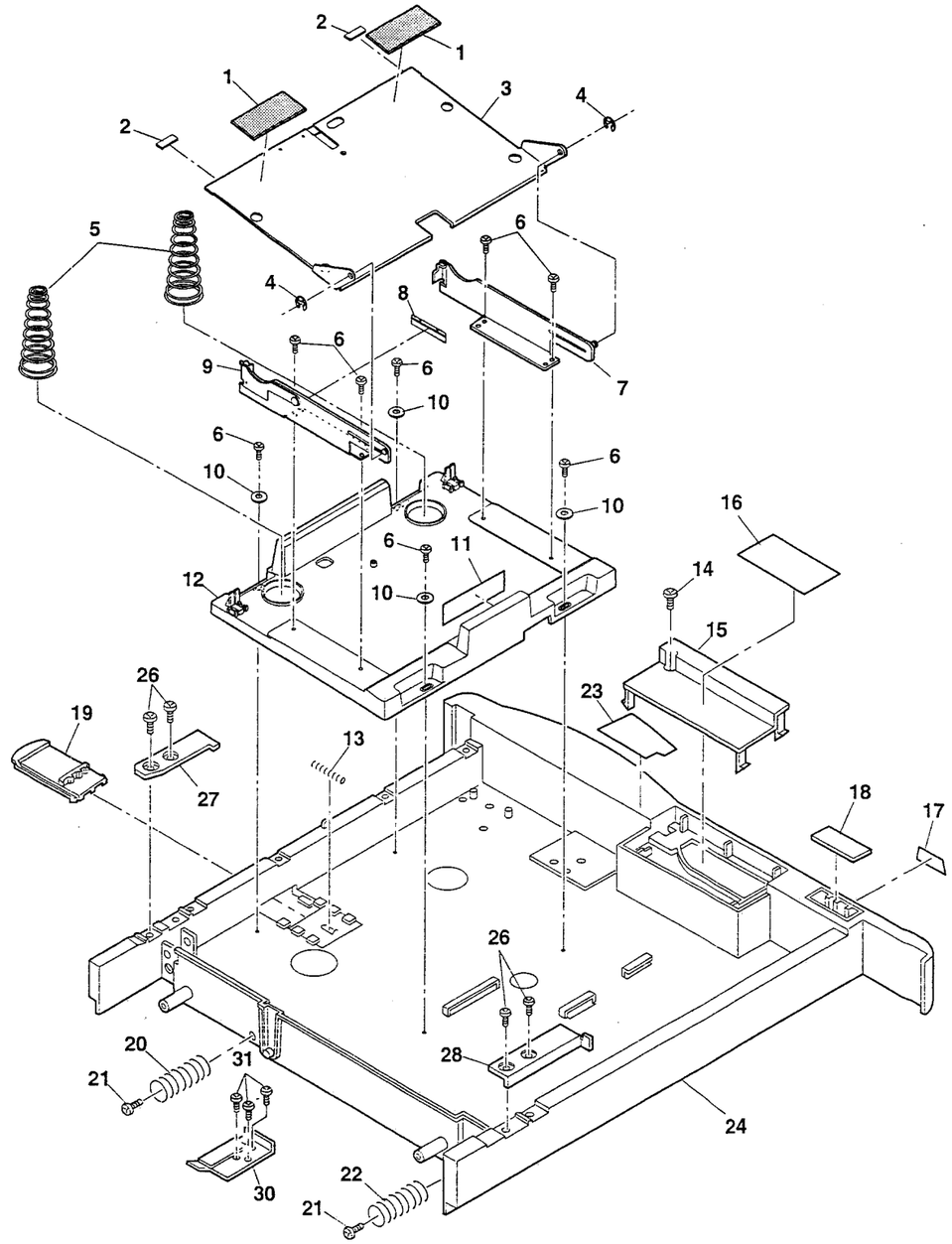
NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	PSHEZ1756FCZZ	AD		C	250 rotation plate sheet
2	PSHEP1753FCZZ	AA		C	Cassette sheet
3	CPLTM2079FC01	AT	N	C	Rotation plate A4 (AB series)
	CPLTM2077FC01	AV		C	Rotation plate letter (Inch series)
4	XRESP50-06000	AA		C	E type ring
5	MSPRC2121FCZZ	AD		C	Rotation plate spring
6	XEBSE40P12000	AA	N	C	Screw
7	CPLTM1903FC02	AS		C	Side plate R
8	TLABZ2253FCWZ	AB		C	Label W
9	CPLTM1902FC02	AS		C	Side plate F
10	XWHSE40-08100	AA	N	C	Washer
11	LPLTP4468FCZZ	AD	N	C	Rear plate A4 (AB series)
12	LDAiU0480FCZZ	AU		C	Rotation plate fixing plate
13	MSPRC1145FCZZ	AA		C	Stopper spring
14	XEPSD40P12000	AA		C	Screw (4×12)
15	PCOVP1059FCZZ	AG		C	Lock cover
16	TLABH3401FCZZ	AD		C	Paper set label
17	TLABH3402FCZZ	AD	N	C	Size label A4 (AB series)
	TLABH3403FCZZ	AD		C	Size label 81/2×11 (Inch series)
18	PSHEP2756FCZZ	AF		C	R base plate sheet
19	LSTYP0179FCZZ	AD		C	R cassette plate stopper
20	MSPRC1914FCZZ	AC		C	Base plate spring 2
21	XEPSD40P08000	AA		C	Screw (M4×8)
22	MSPRC1807FCZZ	AB		C	Base plate spring
23	PSHEP2930FCZZ	AC		C	R base plate protect sheet
24	GDAi-0153FCZ3	BC		C	Lower cassette base plate
26	LX-BZ0586FCZZ	AA		C	Screw
27	LPLTM3766FCZZ	AD		C	Unit lock plate R
28	LPLTM3767FCZZ	AF		C	Unit lock plate L
30	LPLTP3840FCZZ	AG		C	W cassette rail left
31	XEBSD40P12000	AA		C	Screw (M4×12)
32	LRALP0091FCZZ	AM		C	W cassette rail right
33	NROLP0813FCZZ	AE		C	FU transport roller U
34	NSFTZ1605FCZZ	AD		C	W cassette shaft R
35	LPLTG3737FCZZ	AB		C	Rubber plate
36	LPLTM3780FCZZ	AN		C	Sub plate F
37	PSHEP2889FCZZ	AL		C	250-sheet cassette guide mylar sheet
38	PSHEP3086FCZZ	AH		C	W base plate sub sheet
39	GDAi-0152FCZ1	BM		C	Base plate W
40	DHAi-2240FCZZ	AK		C	Lower cassette sensor harness
41	XBPBZ40P06K00	AA		C	Screw (M4×6K)
42	LBNDJ0037FCZZ	AA		C	Wire fixing band (T18S)
43	LHLDZ1032FCZZ	AM		C	W-drive holder
44	XHBSD30P10000	AA		C	Screw (M3×10)
423	———				RM frame unit (Ref.block 4)

90 Packing materials & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	
10	SPAKC4982FC11	AZ	N	D	Packing case (Indonesia only)	(SF-7855)
	SPAKC4982FCZZ	AZ	N	D	Packing case (Other countries)	(SF-7855)
	SPAKC5040FC11	AZ	N	D	Packing case (Germany only)	(SF-7830)
	SPAKC5040FCZZ	AZ	N	D	Packing case (Except Germany)	(SF-7830)
21	TINSE1135FCZZ	AQ	N	D	Operation manual(USA)	(SF-7855)
	TINSE1137FCZZ	AT	N	D	Operation manual(English)	(SF-7855)
	TINSF1138FCZZ	AT	N	D	Operation manual(French)	(SF-7855)
	TINSE1153FCZZ	AT	N	D	Operation manual(Indonesian)	(SF-7855)
	TINSS1139FCZZ	AT	N	D	Operation manual(Spanish)	(SF-7855)
	TINSZ1140FCZZ	AT	N	D	Operation manual(Arabic)	(SF-7855)
	TINSE1180FCZZ	AT	N	D	Operation manual (English)	(SF-7830)
	TINSE1185FCZZ	AT	N	D	Operation manual (U. Kingdom)	(SF-7830)
	TINSF1181FCZZ	AT	N	D	Operation manual (French)	(SF-7830)
	TINSG1182FCZZ	AT	N	D	Operation manual (German)	(SF-7830)
	TINSi1184FCZZ	AT	N	D	Operation manual (Italian)	(SF-7830)
	TINSS1183FCZZ	AT	N	D	Operation manual (Spanish)	(SF-7830)

10 Lower cassette





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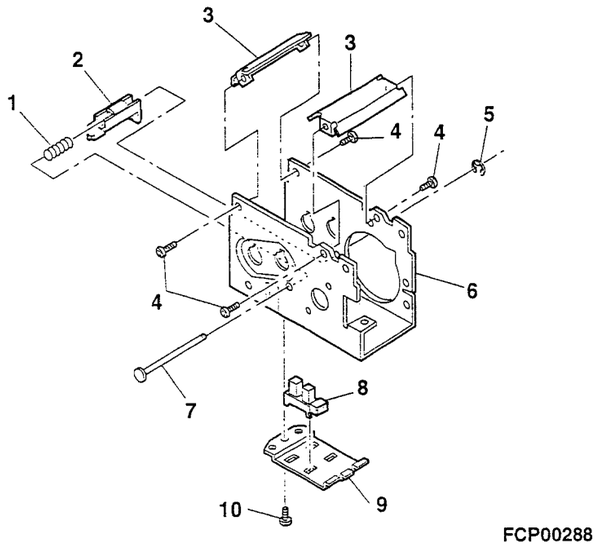
423 RM frame unit



FCP00288

423 RM frame unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
1	MSPRC1991FCZZ	AA		C	CE shield plate spring
2	LPLTP4146FCZZ	AD		C	CE shield plate
3	LSTYM0180FCZZ	AC		C	W drive plate stay
4	XHBSD30P08000	AA		C	Screw (M3×8)
5	XRESP30-05000	AA		C	E type ring
6	LFRM-0696FCZ2	AK		C	RM frame N-1
7	NSFTZ1625FCZZ	AC		C	Shield slide shaft
8	VHPGP1A71A1-1	AG		B	Photo sensor (GP1A71A1)
9	LPLTM3800FCZZ	AD		C	HP switch fixing plate
10	XHBSD30P06000	AA		C	Screw (M3×6)

804 Main PWB

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
804	CPWBN1015FC5A	BY	N	E	Main PWB (Except Germany)
IC2	VHi27C51222FC	AW	N	B	IC (27C51222FC)(Except Germany) [IC2]

Index

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
[C]					
CCAB-0715FC12	1- 403	BA	N	E	
CCAB-0715FC13	1- 403	AZ	N	E	
CCAB-0715FC14	1- 403	BA	N	E	
CCAB-0715FC15	1- 403	AZ	N	E	
CCAB-0715FC16	1- 403	BA	N	E	
CPLTM1902FC02	10- 9	AS		C	
CPLTM1903FC02	10- 7	AS		C	
CPLTM2077FC01	10- 3	AV		C	
CPLTM2079FC01	10- 3	AT	N	C	
CPWBN1015FC5A	804- 804	BY	N	E	
[D]					
DHAi-2240FCZZ	10- 40	AK		C	
[G]					
GDAi-0152FCZ1	10- 39	BM		C	
GDAi-0153FCZ3	10- 24	BC		C	
[L]					
LBNDJ0037FCZZ	10- 42	AA		C	
LDAiU0480FCZZ	10- 12	AU		C	
LFRM-0696FCZ2	423- 6	AK		C	
LHLDZ1032FCZZ	10- 43	AM		C	
LPLTG3737FCZZ	10- 35	AB		C	
LPLTM3766FCZZ	10- 27	AD		C	
LPLTM3767FCZZ	10- 28	AF		C	
LPLTM3780FCZZ	10- 36	AN		C	
LPLTM3800FCZZ	423- 9	AD		C	
LPLTP3840FCZZ	10- 30	AG		C	
LPLTP4146FCZZ	423- 2	AD		C	
LPLTP4468FCZZ	10- 11	AD	N	C	
LRALP0091FCZZ	10- 32	AM		C	
LSTYM0180FCZZ	423- 3	AC		C	
LSTYP0179FCZZ	10- 19	AD		C	
LX-BZ0586FCZZ	10- 26	AA		C	
[M]					
MSPRC1145FCZZ	10- 13	AA		C	
MSPRC1807FCZZ	10- 22	AB		C	
MSPRC1914FCZZ	10- 20	AC		C	
MSPRC1991FCZZ	423- 1	AA		C	
MSPRC2121FCZZ	10- 5	AD		C	
[N]					
NROLP0813FCZZ	10- 33	AE		C	
NSFTZ1605FCZZ	10- 34	AD		C	
NSFTZ1625FCZZ	423- 7	AC		C	
[P]					
PCOVP1059FCZZ	10- 15	AG		C	
PSHEP1753FCZZ	10- 2	AA		C	
PSHEP2756FCZZ	10- 18	AF		C	
PSHEP2889FCZZ	10- 37	AL		C	
PSHEP2930FCZZ	10- 23	AC		C	
PSHEP3086FCZZ	10- 38	AH		C	
PSHEZ1756FCZZ	10- 1	AD		C	
[S]					
SPAKC4982FCZZ	90- 10	AZ	N	D	
SPAKC4982FC11	90- 10	AZ	N	D	
SPAKC5040FCZZ	90- 10	AZ	N	D	
SPAKC5040FC11	90- 10	AZ	N	D	
[T]					
TiNSE1135FCZZ	90- 21	AQ	N	D	
TiNSE1137FCZZ	90- 21	AT	N	D	
TiNSE1153FCZZ	90- 21	AT	N	D	
TiNSE1180FCZZ	90- 21	AT	N	D	
TiNSE1185FCZZ	90- 21	AT	N	D	
TiNSF1138FCZZ	90- 21	AT	N	D	
TiNSF1181FCZZ	90- 21	AT	N	D	
TiNSG1182FCZZ	90- 21	AT	N	D	
TiNSi1184FCZZ	90- 21	AT	N	D	
TiNSS1139FCZZ	90- 21	AT	N	D	
TiNSS1183FCZZ	90- 21	AT	N	D	
TiNSZ1140FCZZ	90- 21	AT	N	D	
TLABH3401FCZZ	10- 16	AD		C	
TLABH3402FCZZ	10- 17	AD	N	C	
TLABH3403FCZZ	10- 17	AD		C	
TLABZ2253FCWZ	10- 8	AB		C	
[V]					
VHi27C51222FC	804-IC2	AW	N	B	
VHPGP1A71A1-1	423- 8	AG		B	

PARTS CODE	NO.	PRICE RANK	NEW MARK	PART RANK	
[X]					
XBPBZ40P06K00	10- 41	AA		C	
XEBSD40P12000	10- 31	AA		C	
XEBSE40P12000	10- 6	AA	N	C	
XEPSD40P08000	10- 21	AA		C	
XEPSD40P12000	10- 14	AA		C	
XHBSD30P06000	423- 10	AA		C	
XHBSD30P08000	423- 4	AA		C	
XHBSD30P10000	10- 44	AA		C	
XRESP30-05000	423- 5	AA		C	
XRESP50-06000	10- 4	AA		C	
XWHSE40-08100	10- 10	AA	N	C	